

AMERICAN GAS ASSOCIATION MONTHLY

MAY • 1936

Tomorrow for the Gas Industry

ALEXANDER FORWARD

•

Experiences during the Floods

•

Objectives in Gas Advertising

DOUGLAS BUCKLER

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AMERICAN GAS ASSOCIATION

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New York, N. Y.

AMERICAN GAS ASSOCIATION MONTHLY

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AMERICAN GAS ASSOCIATION MONTHLY

James M. Beall, Editor

Tomorrow for the Gas Industry

ANYBODY ought to have a good time in discussing "Tomorrow for the Gas Industry." One can let his imagination run and by putting tomorrow off far enough the prophecy is likely to be forgotten anyway. Levity aside, I have some definite, sincere convictions as to our future.

Modern doctors tell us that the length of our lives is determined mainly when we are born and can be affected but little by anything we can do. In other words, our best insurance for an ample life lies in choosing a good ancestry. However that may be from the medical viewpoint, it is not true in the realm of industry and commerce. There eternal vigilance, correct appraisal of all the factors and intimate study of the trends of the times, and alert action, will control. Knowing as I do what is going on within the gas business, I safely predict its permanence and growth as an essential modern American industry.

It lacks nothing now but confidence and the ability and purpose to tell its story.

During the year 1935 there were sold in the United States 1,100,000 gas ranges, an increase of nearly 30% over the 1934 range sales. These gas ranges installed in 1935 in our homes equal the total of electric ranges now in use in the United States, installed during a generation. Leaving out the electric ranges in use where gas is not available, perhaps twice as many gas ranges were sold in one year as all the electric ranges in use which are competitive.

Nearly three quarters of our 1935 gas range sales were of higher grade

By **ALEXANDER FORWARD**

Managing Director,
American Gas Association

and more expensive models incorporating automatic and convenience features. Every one of these modern ranges will give service equal in every respect to the best electric range, and will give superior service in most instances at considerably lower cost of operation.

Can anyone visualize the home-makers of America discarding instruments of perfect service, representing substantial investments, when they can get nothing better at any price?

There is but one thing that can in-

duce them to change, and that is to have propaganda drilled into their minds that electric cooking is modern and gas cooking is out-moded.

It is however true that those housewives who have obsolete gas ranges, unattractive in appearance, inefficient in operation and lacking convenience features, can readily be induced to believe that a change will modernize their kitchen. It would modernize them. Our gas companies can make them modern by selling up-to-date ranges.

All of us must however admit the tremendous driving power behind the effort to sell electric cooking devices. This motive power does not come from operating electric companies but from heavily financed groups of manufacturers who are interested not alone in the sale of appliances but in all sorts of electric production and distribution machinery and equipment. They are not neglecting to avail themselves of the boost given their business by the attitude of some of the agencies of the National Administration in Washington.

What can we do about this? There is unmistakable evidence that the gas industry is wide awake to the fact that it is today at the cross-roads. We have pledges of support to insure a campaign of advertising domestic, commercial and industrial uses of gas in media of national circulation, and the organization for carrying out this important task is now being perfected. The amount of money available will in no degree equal that at the disposal of our competitors but it will be



Alexander Forward

enough to keep gas and its essentiality and modernity before the American people. You will soon see a greater degree of confidence within the ranks of our own officials and employees and you will see a more favorable attitude upon the part of our customers and the holders of our securities.

A further demonstration of this awakened spirit is in the success and popularity of the broadcasting of the Mystery Chef program. Sponsored and financed by a group of gas companies along and near the Atlantic Seaboard from the Potomac River to the New Brunswick line and west to Buffalo, the program has extended to other sections until it now comprises about 50% of the domestic gas meters of the country. This remarkable individual has a way with him, perhaps not easily discernible by the male sex, but he gets results. A friend tells me that on returning home the other evening his wife presented him with strawberry shortcake saying that she had to visit four groceries to get strawberries, each merchant inquiring what was the matter with the women of that town. A recipe of the Mystery Chef that day was strawberry shortcake. A holding company executive received an SOS wire from his local manager in a community within the Mystery Chef's area, saying he had to have a supply of those cook books or leave town.

Do not forget that sales of gas refrigerators in 1935 were 56% more than the sales for 1934.

Economics Favor Gas

This is not just a gas man's talk. Let us call two witnesses. Herman Russell, president of the Rochester Gas and Electric Corporation, which derives the larger part of its revenues from electric service, has repeatedly stated in public lately that there is no economic nor social reason for electric cooking where gas cooking is available, and that combination companies will before long realize their mistake in making low unprofitable rates for electric cooking and water heating at the expense of profitable yet low customer rates for gas cooking.

The Edison Electric Institute asserts that increases in domestic electric usage in the past six years are due entirely to radios and refrigerators and that

Advertising Counsel Selected for National Campaign

The committee charged with the duty of selecting the agency for the American Gas Association in the forthcoming program of national advertising met on April 21 and recommended unanimously that McCann-Erickson, Inc. of New York should be selected to handle domestic gas advertising and that whatever amount of the total fund might be set aside for commercial and industrial advertising should be expended through Ketchum, MacLeod & Grove, Inc., Pittsburgh, Pa., the present agency for Industrial Gas Section advertising. These recommendations have been approved by the Committee on National Advertising.

Representatives of companies participating in the program who are serving on the Committee to Conduct National Advertising will meet in Association Headquarters, April 29, for the purpose of organizing, formulating basic policies and discussing them with the agencies.

other uses (including of course cooking) have made no advance at all.

There is significance in the splendid support and cooperation given by our gas companies to the American Gas Association sales contests in ranges, heaters and refrigerators. The year 1936 may be the best in our history in the sales of domestic appliances.

Such interest has been aroused that pledges of support are given, and an enlarged program constantly urged, in the field of research. Through good times and bad the Executive Board of the American Gas Association has resolutely prosecuted a program of research in industrial gas utilization which has made excellent progress. In the Cleveland Laboratory for nearly a year we have been investigating the possibility of improvements in domestic appliances, and some noteworthy results are already being incorporated in the 1936-1937 gas range models.

Our safety for tomorrow lies in just such intelligent comprehension of our problems and in just such determination to arrive at their solution. We have everything it takes to make a great and growing industry, the most scientific form of dependable, flexible, adaptable heat for home and industry, the technical skill, the will to do and the resources with which to do it.

Confidence Only Lacking

To repeat, if we lack anything at all it is confidence and knowing how to tell our story. We have 16,002,000 customers, more than ever before in our industry. We know how to serve them to their best interest. The advertising job done by our companies is already excellent and its quality and quantity are constantly increasing.

Across the frontiers of tomorrow marches a new generation. Their needs must be met and their education must not be neglected. Let us not be afraid of any carping criticism that says that we alone of all the country's industries are to be condemned if we attempt to instruct this new generation in the conveniences and comforts of our service. In most instances we will find ample opportunity through teaching and demonstration to inform the home makers of tomorrow.

There can be no doubt of the future of an industry possessing these opportunities and the spirit we are now displaying.

Pacific Gas Announces Rate Reduction

THE Pacific Gas & Electric Company, San Francisco, Calif., has announced a reduction of approximately \$2,500,000 a year in natural gas rates, effective May 1 throughout northern California. The most unusual angle of this voluntary reduction is the fact that it is \$400,000 more than the reduction ordered by the State commission in 1933, which the company recently fought to a successful conclusion before a 3-judge statutory court. In announcing the voluntary reduction, the president of the company pointed out that conditions have changed considerably since 1933, both as to the general economic situation and as to abnormal expenses incident to the introduction of natural gas. That a compromise would follow the court case was expected, but so large a voluntary reduction took most local observers by surprise.

—P. U. R. E. I. S.

Gas Industry Loses Outstanding Leader

HERBERT O. CASTER, general counsel and director of gas and oil companies of the Cities Service Company, past president of the American Gas Association, and one of the most prominent and widely respected utility executives in the nation, died April 14 at the Polyclinic Hospital, New York, N. Y., after an illness of several weeks. He was sixty-four years old.

Mr. Caster's death brought to a close a colorful and varied career in which he won prominence as an educator, public servant, an attorney, and more recently as associate head of natural gas and oil activities of Cities Service Company. His death came at a time when he was in the midst of plans for wider expansion of the use of natural gas and the exploration of new fields.

Was A. G. A. President

In 1933-1934, as president of the American Gas Association, his outstanding leadership of the gas industry during the critical N.R.A. period, and at a time of widespread political attacks on public utilities, earned him the respect and admiration of the entire industry. The spirit and inspiration of his vigorous leadership at the 1934 convention were largely responsible for making it one of the most successful meetings in the Association's history. He was a director of the Association at the time of his death.

Mr. Caster was born on August 28, 1871, in Ohio. At an early age his parents moved to Kansas. After attending the rural schools in Decatur County and Oberlin, Kansas, High School, Mr. Caster was graduated from Ottawa University in 1898. Following his graduation he was elected supervisor of the Oberlin Public and High Schools. He organized a new school system and introduced a four-year course fully accredited by the state university. In 1903 he secured the passage of the law providing for the establishment of the Decatur County High School and was a member of its board of directors for eleven years. For six years he also was a member of the board of directors of



Herbert O. Caster

the Board of Education for the city schools in Oberlin.

In 1900 he was elected county superintendent of schools for Decatur County, Kansas, and re-elected in 1902.

He was admitted to the bar in Kansas in 1906, and practiced law in Oberlin. In 1908 he was elected county attorney for Decatur County. From 1911 to 1914 he was engaged in the private practice of law. In 1914 he was appointed attorney for the Kansas Public Service Commission. On January 1, 1918, he resigned from this position and again entered the private practice of law, this time in Topeka, Kansas, where he was affiliated with the well-known firm of Stone and McDermitt.

On May 1, 1919, Mr. Caster became associated with Henry L. Doherty as general counsel for the Empire Gas & Fuel Company, of Bartlesville, Oklahoma, which position he held until September 20, 1925, when he entered the New York office of Henry L. Doherty & Company as a member of the executive committee. From 1923 to 1925, while living in Bartlesville,

he was chairman of the Board of Education for the city schools.

Mr. Caster was an officer and director of 46 corporations, including such prominent companies as Arkansas Natural Gas Corporation, Cities Service Company, Crew Levick Company, Dominion Natural Gas Company, Ltd., Empire Gas and Fuel Company, Federal Light and Traction Company, Kansas City Gas Company, Louisiana Oil & Refining Corporation and the Natural Gas Pipeline Company of America.

He was a member of the Bankers and Advertising Clubs and the Ohio Society of New York and the Kansas City Club.

He is survived by his widow, the former Maud Van Gundy of Oberlin, to whom he was married in 1900; two daughters, Mrs. E. F. Walsh, Jr., of Kansas City and Miss Mary R. Caster; three brothers and three sisters and two grandchildren. A son, Robert E. Caster, died in 1932.

T. A. Vander Willigen Dies

T. A. VANDER WILLIGEN of Brussels, Belgium, European representative and director of Humphreys and Glasgow, Ltd., London, and a member of the American Gas Association since its organization, died in Antwerp, March 27. He was 70 years old. While he was particularly well known to engineers in Belgium, Holland and England, he also had many friends in this country who held him in great esteem. He had been connected with Humphreys and Glasgow for about forty years.

George F. Oxley Dies

G. EORGE F. OXLEY, formerly public relations director of the National Electric Light Association, died suddenly in New York, N. Y., April 21. He was fifty years old.

Mr. Oxley worked on newspapers in Worcester, Springfield, Mass., Boston, and Denver, and later became secretary of the Colorado Public Utilities Commission. During the World War he was manager of the American Red Cross division at Denver. He came to New York in 1920.

Surviving are two brothers, Harold R. and Norman M. Oxley.

Experience of the Equitable Gas Company during the Pittsburgh Flood

THE Allegheny and Monongahela Rivers meet at Pittsburgh's historic "Point" forming the Ohio River which carries their waters westward to the Mississippi. The two rivers traverse and drain an extensive area extending from New York State, through Western Pennsylvania, down into Central West Virginia—an area of approximately 18,920 square miles.

Both watersheds were laden with a heavy blanket of snow all winter and, due to extremely low temperatures, were frozen to an unusual depth. Late February thaws freed the ice in the rivers which went out with unusually high water. There is an old saying among rivermen that, "When the river leaves ice high on its banks, it always comes back for it." All during the first two weeks of March snows and rains in rapid succession over both watersheds kept the two rivers' banks full as an already saturated terrain refused to absorb any more moisture. An average precipitation of over five inches was recorded over all of both watersheds during this period and on March 17, points on the upper Monongahela as well as the Allegheny reported more than two inches of rainfall.

Coincidental Floods

Wednesday, March 18, saw happen what had long been feared. Both rivers passed flood stage and the crests descended on Pittsburgh coincidentally.

Many times before either one river or the other has flooded with little resultant damage. This time both flood crests arrived at one and the same time and the resultant 46-foot river stage topped flood level by 21 feet and eclipsed the former high water mark of 38.7 feet made March 15, 1907—the highest water of actual record.

The resultant damage was terrific. Money loss estimates for Allegheny County (of which Pittsburgh is the seat) ran as high as \$300,000,000. A total of 32 people were known to be drowned and, in the Pittsburgh district, 135,000 unfortunates were rendered homeless.

By G. H. NEILSON, JR.

Supervisor, System Operation

In the midst of the disaster all utilities but one failed wholly or in part. Electric power went clear out of the picture with the flooding of the power stations. When power failed, street cars stopped. Water reserves dwindled and many systems were dry before pumping stations could be restored



Wood Street looking towards Liberty Avenue

to service. Gas service was maintained except in the flooded areas. There were persistently recurring rumors that gas service would be discontinued—rumors the birth of which was undiscoverable and which caused a deluge of calls at all gas headquarters. Such action was far from the thoughts of gas operating men.

The Equitable Gas Company serves the majority of the people in the district who were in the path of the flood. A total of 20,000 customers, most of whom had fled their homes, were without gas. On the other hand, 89 per cent of the customers of the Equitable Gas Company noticed no variation in the quality of their gas service.

Many factors combined to make such a record difficult. These were the unprecedented height of the flood waters, the rapidity with which the flood rose, the lack of forewarning of the possible river stage, the failure of electric power, the interruption of telephone communication, the difficulty of transport from point to point, and the

fact that the distribution system is spread over such a considerable area divided by the three rivers.

From the "Point" (the confluence of the two rivers) to twenty-five miles up the Allegheny, the Equitable Gas Company serves Downtown Pittsburgh and the North Side, the Strip (that section of the city which lies between the river and the hill), the towns of Millvale, Etna, Sharpsburg, Aspinwall, Blawnox, Montrose, Verona, Oakmont, Harmarville, Springdale, Parnassus, Tarentum, and Brackenridge—all affected by the flood.

Widespread Area Affected

From the "Point" to fifteen miles up the Monongahela, the Equitable Gas Company serves Downtown Pittsburgh and the South Side, the towns of Hays, Homestead, Braddock, Duquesne, Port Perry, Port Vue, Dravosburg, and McKeesport, while on Turtle Creek the company serves Wilmerding, Turtle Creek, and East Pittsburgh—all affected by the flood.

From the "Point" to about seven miles down the Ohio, the Equitable Gas Company serves the lower North Side and West End, Pittsburgh, and the towns of Esplen and McKees Rocks, while on Chartiers Creek it serves Carnegie. All these towns were flooded to more or less degree.

With the area served covering roughly 40 miles of river bank (both sides) and all being inundated, it is obvious that no great concentration of man forces was possible.

Before noon on Tuesday, March 17, the rivers reached flood stage and were still rising. No alarm was felt because the official prediction was for a stage of 32 or 33 feet, which would have caused little trouble. Early in the afternoon, steps were taken to combat the then expected crest.

By Tuesday evening, March 17, the rivers had reached 34 feet and were still rising. Still no alarm was felt because, due to a lack of up-river information, the prediction was still far short of the actual peak reached.

That same evening things began to occur with bewildering rapidity. The rivers crept out of their banks and fast approached district regulators heretofore believed to be well above any possible high water level.

The fight then was to maintain service in all but the flooded areas and to get all customers who were flooded shut off. The waters rose too fast to accomplish the latter.

At the same time, the company telephone system started to fail, due to inundated cables, isolating many points from contact with the centers of operation.

Conditions continued to become worse and worse until the flood reached its crest on March 18 about 7:00 P.M. At this time it was practically impossible to get from one point to another on the system, telephone contacts where at all possible were precarious at best, and many crews and individuals were, and had been for hours, completely isolated from supervision. That the men kept at the job hour after hour and that not one serious error in judgment was made



Boulevard of the Allies looking toward Market Street (Market Street was one of the two dry spots in the Golden Triangle)

will stand a lasting monument to their loyalty and efficiency.

In the Pressure Control Office in the central office building, from which the entire system is operated, are gauges showing the pressures at McKees Rocks, Carnegie, North Side,

the "Strip," East Pittsburgh, Sharpshurg, and the City low pressure system. These gauges had been going out one by one as the telephone cables failed and by four o'clock Wednesday afternoon when electric power failed the only gauge functioning was the City low pressure—of no value at all in operating the high pressure system. Fortunately, 'phone communications with the important points in the producing field were maintained although orders had been given as to what to do if the 'phones went out. Meanwhile the men in the Pressure Control Office were operating the entire distribution system from readings taken at the principal measuring station seventeen miles south of Pittsburgh. And gas service was maintained with no var-

iation everywhere except in those locations affected by the flood.

The men who were working or on call night and day were furnished with cots and blankets, credit was established at convenient restaurants, supplies of drinking water were obtained and hundreds of anti-typhoid doses were given to those who wanted them. Hundreds of flashlights, lanterns, hip boots, raincoats, and rain hats were distributed.

Service Difficulties

With the crest of the flood past and the water receding rapidly there remained a tremendous job. Every flood-stricken customer had to be shut off, mains, service lines, meters, and house lines had to be drained of water and, where necessary, repaired, flooded district regulators had to be torn down, rebuilt, and restored to operation and finally each customer had to be revisited and his service turned on. With 20,000 customers out, this was an imposing task to face.

The greatest difficulty experienced was with water in the mains. Unlike a manufactured gas system, a natural gas system is built with very few drips and little attention to high and low points since natural gas is dry by the time it reaches market. The result was that hundreds of taps had to be made and pumps installed to free the lines of water. At the Penn Theater, past which there is a 20-inch low pressure line, 6,500 gallons of water were re-

An Appreciation From Your Gas Company

To the many organizations which helped to keep the public informed that Natural Gas Service would remain adequate throughout the flood emergency, the gas companies of Pittsburgh extend their deep appreciation—not only from themselves but in behalf of a runner-confused public.

Newspapers, radio stations, The American Red Cross and The Boy

Scouts of America gave every possible aid in transmitting instructions from our companies to gas users whose water-heating and central house heating appliances had been made useless by flooded basements.

The Pittsburgh Police and National Guard cleared the way for our

speeding emergency crews in the Golden Triangle when flooded streets necessitated shutting off gas mains in the business district.

The Bell Telephone Company gave unstinted attention to maintaining communication between gas company headquarters and their crews throughout the flood districts.

Our employees forgot time and their own personal and family needs to be on 24-hour duty to give aid wherever and whenever needed.

PLEASE TAKE THESE PRECAUTIONS:

If Your Basement Was Flooded—
If you are not absolutely sure how to resume operation of flooded appliances, call your gas company and a service man will come to your aid just as quickly as possible.

If Your Gas Heating Plant Is Thermally Controlled—
A gas company service man will re-adjust it for automatic operation as soon as possible.

If in doubt about anything in connection with your gas service, call your gas company.

The emergency has been great, but we were able to meet it, and the help of these many agencies and the volunteer effort of hundreds of individuals were of immeasurable importance.

Natural Gas Companies Serving the Greater Pittsburgh Area

Courtesy Gas Age-Record

Cooperative advertisement published by the natural gas companies serving the Greater Pittsburgh area, thanking the public for its cooperation during the emergency

moved from the main in one day—and it still came.

The water in the mains would move and where a customer's service had been restored, quite frequently would come the call, "Out of Gas." A return visit would find water in the line, nothing at all (in which case water had trapped off the gas), or a vacuum on appliances (in which case moving water was creating a vacuum behind it).

Thorough inspections were made of all buildings in the flood zone before service was restored. City and Bureau of Mines inspectors aided materially in this work.

One great hazard spawned by the flood was that of breaking mains due to settling of the thoroughly soaked and (in some cases) undermined streets. To forestall this danger, patrols were organized and equipped with safety lamps with which they tested all curb boxes, gate boxes, man-holes, and sewer drops for the presence of gas. These patrols were active night and day going over and over the flood-stricken area.

While this was going on, the field forces in Pennsylvania and West Virginia were experiencing an epidemic of line breaks and leaks due to landslides. In one week no less than 21 of these occurred, but an alert personnel in the field divisions kept the gas supply coming to Pittsburgh without the faintest sign of any shortage.

In two weeks practically 100 per cent restoration of service had been accomplished. Many houses and buildings were vacant or condemned but all active customers had had gas service restored, and the 160,000 customers who were not in the direct flood zone had not lost a minute's regular service.

The recurrence of high water on Wednesday, March 25, inundated some sections for the second time and necessitated a repetition of the work already done. However, little damage was done.

One more item is well worth mentioning. Working long hours under the most adverse conditions and under the stress of speed should logically lead to a very poor safety record. In spite of conditions and to spite logic, the men of the Equitable Gas Company met and overcame the flood emergency with only two lost-time accidents (neither very serious) and but four accidents of a minor nature.

Flood Waters Halt Nashua's Gas Supply for First Time



Producer house, Nashua. Line indicates approximate water level

By W. F. NORTON

District Manager, Public Service Company of New Hampshire, Nashua, N. H.

THE second week in March, the water in the Nashua and Merrimack Rivers rose to about four feet below the high-water mark of March 1896, which has been the high-water mark up to this flood. We did not give it much thought as the rivers receded rather quickly. The only damage was caused by the ice coming down the river and taking away some of the smaller bridges and a few houses in the lowlands. We have had snow on the ground since December without a sign of a thaw during the whole winter and four and a half feet of frost within the ground which made conditions ideal for a freshet.

This water disappeared and we thought we were all right. Then, the week of March 15, we began to have warm rains, temperatures running up to 60-65 degrees which melted this great amount of snow very rapidly. At Mt. Washington in three days four feet of snow entirely disappeared.

The gas and electric plants are located on the bank of the Nashua River, a few hundred feet from the Merrimack River, and here the rivers started to rise Monday but we were not worried about it until Thursday noon when it started coming up

a foot an hour and in a short time it had left its bank and was over in the yard. First we lost the electric power and lights, then the telephone, and as the water kept rising we lost the steam boiler, which drove us to the waste heat boiler in the vertical retort house plant. We kept going with this until the water got into the producers which shut the plant down at 6:15 on Thursday afternoon.

All the time we were being told up river that the peak had been reached and if we could hold on we could get by. The last charge was put in at 4 o'clock with the bottom men in water to their waist. Still the water kept rising which made us tap the retorts, close the valves in the exhaust room and leave things as safely as we could. We had at this time, been forced out of the works' office and had moved to the street governor house where we stayed until 12:45 A.M. Friday when the water came up within a few inches of the street governor. To keep the distribution system dry we had to close these valves which shut the city off,—the first time in the history of the company dating from 1853.

In the meantime, we had removed as many of the motors as we could from different parts of the plant which was a great help when we came to starting up. A great deal of this work had to be done in water 3 feet deep and with the help of boats we were able to pick up. When we left the plant we put our hopes on the



Relief holder destroyed by the flood at Nashua

Springfield Maintains Gas Service During Flood Emergency

By A. S. HALL

Superintendent, Springfield Gas Light Company, Springfield, Mass.



Pump room, Nashua. Line indicates approximate water level

water gas plant to get us going but when we were able to get into the plant Saturday morning by rowing $\frac{3}{4}$ of a mile, we found both relief holders wrecked. Making water gas was out of the question so we turned to the vertical plant which had been in service $8\frac{1}{2}$ years. On Sunday morning we started cleaning the producers and had fire going in the afternoon and we started making gas Tuesday afternoon. On Wednesday we were able to make 500 M cu.ft. of 550 B.t.u. gas. While the producer fires were out and the producer covered with water for three days, the retort settings were not touched and they retained heat enough so they did not crack.

After getting all the 5,500 meters in the city turned off, we turned the gas on to the city Thursday morning after six days of being without it.

We did all this work at the plant and on the distribution system, without an accident of any kind. The conditions we had to meet were of such a serious nature that no human being could do anything to stop the terrific flow of raging water ten feet over the plant; holders raised out of their pits, turned over and wrecked beyond repair.

We planned ahead to shut off meters and valves in the flooded area, which kept the system dry. In the plant we were very careful to shut down apparatus so no explosion could occur.

One of the bright spots of the whole thing was the loyalty shown by the employees working as long as 72 hours without sleep, giving everything they had to keep the service going, and also the patience and cooperation of the public in our great difficulty.

LIVING alongside of a river, naturally we have studied it for some time, and we have records of river levels since 1801. The highest level that the Connecticut River reached up to March 20, 1936 was on November 6, 1927. The flood of 1927 was caused by heavy rains as far north as the Canadian border. This flood did no damage to the gas or electric companies.

The present flood was caused by the heavy snowfall in early February and the continued cold weather up to March 17 when a heavy rain and a temperature of 65° F. melted all the snow in the upper valleys in two days. The ground being frozen, the only place the water could go was into the rivers. There was no flood damage north of White River Junction, Vermont.

There was no great amount of damage to the Springfield plant. The distribution system in the flooded areas gave us our greatest damage.

At the peak of the flood the water filled all of the coal pits, and came up about two feet in the plant. This shut down the coal gas plant. All the electric power was off so that all coal, coke, and boiler fuel machinery was dead. Our steam plant

could be operated by taking fuel up on a steam hydraulic elevator to the coal bunkers. The ashes could be taken out by hand, the men working up to their knees in water.

Our water gas plant could be operated, the steam turbine blower units being on a level with the operating floor. The risers to all drips had to be brought up above flood levels. Fuel for the water gas plant was brought in from local coal dealers who were not in the flood area and hoisted to the operating floor by hand.

Oil was hauled in from the Standard Oil Company in 3,000-gallon tanks at the rate of 15,000 gallons per day.

There was no trouble keeping gas on the town although the demand was great, owing to meters having floated and broken their connections. To add to this the Holyoke plant was flooded and had to be abandoned. We took on their load. Later the Hartford plant was flooded and the pumping plant that supplies the Northern Connecticut Company had to be shut down and we took their load. This made a lot of hand labor in getting fuel and oil to the water gas machines.

Since the flood has gone down we have had to remove all the meters in the flooded area; clean and inspect them. We have also had a number of cave-ins which have broken our mains.

Flood Scene in Cincinnati, Ohio



Courtesy Gas Age-Record

When the Ohio River reached flood stage, the Union Gas and Electric Company, Cincinnati, encountered many distribution problems. Even where service had been turned off, drips were pumped continually to prevent slime seepage. Much of this work was done by boat crews, making regular trips, or by men stationed at drip stands, such as the two shown here

Hartford Serves 85% of Its Customers throughout Record Flood



Front Street plant after water had subsided over a foot

AFTER 300 years "Old Man Connecticut" River proved it could happen here and Hartford experienced a flood establishing a new all-time high at practically a 38-foot stage, outstripping by over six feet the previous maximum flood in 1854.

A twelve-hour warning that a flood was on its way permitted the carrying out of all reasonable plans for protection around the gas works such as taking care of all drips, valves, and filling oil tanks with water. The service building adjoins the works and a supply of meters and appliances were taken out of the building and moved to what was considered a safe, higher elevation, only later to be moved again.

Employees Driven Out

After a very rapid rise all night Wednesday, March 18, the river had reached the 29-foot level by early morning, March 19, and before midnight of the 19th had risen to such heights that the gas company had in turn been driven out of its service building, main office and plant on Front Street. This was the first time in 88 years that some one had not been on duty within the plant. Steam and electricity had both failed and all pumping equipment was under water. The plant employees retreated to higher ground and stood watch with

By P. R. BUCHANAN

**Vice-President, The Hartford Gas Co.,
Hartford, Conn.**

rowboats available to make property inspections.

Telephone service was sorely disrupted and electricity was off a major portion of the city and the bridge across the Connecticut River was closed so that a line of communication was most difficult.

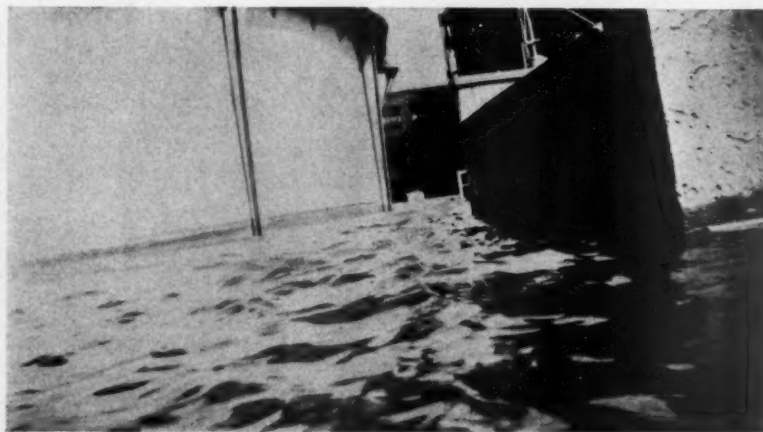
The gas company has for over a year been purchasing all its gas from the Koppers Company plant in New

Haven, and the pipe line delivers it to a five million cubic foot waterless holder at Madison Avenue in the western part of Hartford proper, well out of the flood zone. Line pressure of this line from New Haven was turned direct on our system through the governor. This fact enabled 85% of the customers to enjoy normal gas service all through the flood period. The territory adjacent to the river and all consumers east of the river were out of gas service by Friday night due to the inability to use pumping equipment at the Front Street plant and the filling of the mains in the inundated area. The crest of the flood was reached on Saturday at which time the service building had 12 feet of water on its ground floor, the plant about 8 feet, and 2 feet on the main floor of the main office building in the heart of the town on Pearl Street.

Temporary headquarters were quickly established for main office contacts and payment of bills in the center of the city.

Service headquarters were established at the home of an employee in West Hartford, where telephone service was not interrupted, and service to the majority of customers went on as usual.

The major problem was one of distribution. When electric service failed



Waves around city governor house



The Front Street plant (top, center) was flooded to a depth of 10 ft. Fortunately, one holder station is on higher ground and operated 100 per cent

at the Madison Avenue holder station the attendant used his ingenuity in procuring a steam pump and a Street Department air compressor to operate it for the purpose of pumping tar to the top of the piston on the waterless holder. This scheme worked and the piston seal was maintained at normal level until the restoration of current.

Gas ranges were vitally needed for boiling water and milk, and gas refrigerators offered the only protection for foods, serums, etc.

House heating customers were covered promptly and instructed in the manual operation of their furnaces.

New appliance connection work was turned over to plumbers and dealers.

A plan among other things embraced the printing and distribution from door to door of advance notice of what to do and what not to do in regard to gas appliances, full sets of instruction and report blanks for fitters both in turnoffs and turnons and different color tags to leave at consumers' premises where admittance was not gained, advising them what conditions were and what to do. The towns out of service were split into zones and working groups with a captain assigned to specific streets.

Free use was made of the radio and newspaper advertisements to keep the people informed of the gas situation.

On Tuesday night, March 24, wood to start boiler fires was rowed into the

plant and steam was available before dawn to start compressors, which were then out of water, and gas was once more on its way to Manchester, East Hartford and Glastonbury. With the aid of men from Providence, New Haven, Bridgeport, New Britain and Waterbury Gas Companies, service was restored during the next three days to practically all customers who were able to occupy their homes. All this was

accomplished without a single accident, and one thousand feet of temporary main had to be laid. About 1000 waterlogged meters were removed.

Throughout the whole trying period the spirit of willingness of the employees to work long stretches without rest, the cooperative spirit displayed by fellow gas companies near and far, and the superhuman efforts of the local utilities to aid each other; that is, electric company, telephone company and gas company, all of this was a shining example of devotion to duty and mankind. The 85 per cent of the customers who enjoyed gas service all through the flood will not soon forget this service, and even those out of service for several days were full of praise for the promptness of restoration under existing conditions. While service was normal by the end of the second week the sears of battle will take all summer to erase.

Gas Send-Out Increases

REPORTS from a group of companies representing approximately half of the manufactured gas industry in the United States showed an increase in gas send-out for March of 3.4 per cent over the same month of 1935, the American Gas Association statistical department reported.

For the three months ending March 31, the increase in gas send-out, after allowing for the extra day in February, 1936, was 4.3 per cent.

Sacramento Reports Against Municipal Ownership

ON February 13 the Sacramento City Council passed a resolution instructing its City Manager to investigate the feasibility of the city entering into the natural gas business. The city is now well served with both electricity and gas by the Pacific Gas and Electric Company, but as in many California cities there is a strong municipal ownership bloc which was successful last year in persuading the voters to approve a 12-million dollar bond issue for the construction of a municipal utility district electric generating plant and distribution system.

Early in April, City Manager James S. Dean, made his report on the natural gas situation. This report finds the construction of a competing distribution system to be so impracticable as to be inconceivable, thus reducing the study to the economics of condemning the present facilities of the Pacific Gas and Electric Company and purchasing gas wholesale from that company at the city gate.

After studying operations of the municipal gas departments in Palo Alto and Long Beach, Mr. Dean estimates that the investment required in Sacramento would approximate 4 million dollars, annual operating expense would approximate \$731,400 (including gas purchases at 35 cents per M cu.ft.), bond interest and depreciation \$225,000, loss in taxes now paid by Pacific Gas and Electric Company \$96,000, and annual capital outlay \$25,000, a total of \$1,077,400. The gross revenue of Pacific Gas and Electric at its present rates is \$1,162,000, but a rate adjustment has already been announced which will reduce this by about \$160,000 per year.

Mr. Dean, therefore, finds that the city would not be able to reduce rates and that it would incur a deficit of approximately \$74,500 a year by charging the new Pacific Gas and Electric Company rates. The investment estimate of 4 million dollars includes a 5 per cent allowance for severance damages, but does not include the stand-by oil gas manufacturing plant valued by the Railroad Commission at \$1,400,000.

—P. C. G. A. News Letter.

The Highlights of the Lawrence Flood

AS early as Wednesday, March 18, the management was apprehensive of the continually rising waters of the Merrimac River, and an hourly check of the upstream conditions as far north as 60 miles above the City of Manchester was tabulated throughout the night and following day. By Thursday morning, it was indicated that the river would reach serious flood proportions.

Protective measures were immediately set in motion to protect our property adjoining the river by means of sandbag dikes along the riverbank and around the boiler plant and substations at the gas works on Marston Street. Drain lines from the plant to the river were plugged. All tanks above the surface of the ground were filled with water to their capacity to keep them from floating off their foundations. Drip risers were extended to a point outside of the probable flood area, and incidentally they had to be extended two or three times beyond the original extension. All underground oil tanks were checked for tightness and vents plugged in order that our gas oil supply would not be contaminated.

By R. H. PATTERSON

Vice-President, Lawrence Gas & Electric Co., Lawrence, Mass.

Having the knowledge that the river would probably rise to unprecedented heights, our principal objective at the time was to keep operating at capacity so that in the event the flood waters did reach the boiler plant and substation, all available holders would be filled to capacity.

At 5:00 P.M., Thursday, March 19, the river had reached a height of 31 feet. The height of the boiler room floor is 31.25 feet. We were from then on relying on our sandbag barriers and dikes to keep operating. Throughout the night these barriers were continually reinforced with more sand bags, which enabled us to operate until 5:00 A.M., Friday, March 20, when a sudden rapid rise of the river swept everything before it and flooded



Coke pile when flood waters had receded after washing away 663 tons of coke



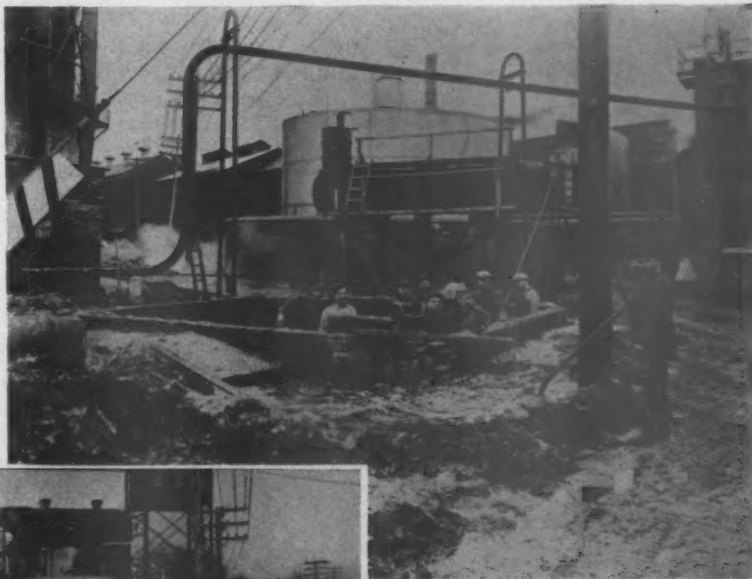
Lower yard of Lawrence gas plant where tons of silt and sand were deposited by the flood

the boiler plant, lower floor of the water gas plant and our electric substation, leaving the plant in darkness, without power and steam.

At this time we had a sufficient supply of gas on hand for a normal twenty-four hour day. Our first problem was to conserve this supply. Street pressures were immediately cut to a minimum and the same day a notice appeared in the local newspapers notifying our customers that in view of the conditions it would be advisable to restrict their use of gas as much as possible.

The coal gas plant being motorized with D. C. equipment through the

electric substation was also shut down insofar as operating equipment was concerned. Having no steam it was not possible to operate any exhausters. The problem then became one of providing some means of operating our coal gas plant. This was accomplished by acquiring a steam portable vertical boiler, a locomotive from the Boston and Maine Railroad, together with our own locomotive crane, which were connected into the steam headers and provided power for transferring water gas from the relief holders to the storage holders, and for pumping gas away from the coal gas plant into the storage holders.



Crew of workers taking out thin tar and fine sand from the tar separator



Water gas plant after the high water subsided

Hand firing and drawing of the retorts was started Friday, March 20, but this type of operation provided only a limited amount of gas which was far from enough to carry the existing load.

In the meantime a motor generator set was located in South Boston, but it required 440 volt transformers. These were finally located in Worcester, and both units were hurriedly transported to Lawrence, arriving early Saturday morning, March 21. The problem of getting the unit in operation offered many obstacles such as the lack of transformer oil which had all been lost in the flood. A rheostat had to be assembled from a scrap heap and a

temporary 2300 volt line had to be run from Marston Street. However, by 4:00 P.M., Saturday, the unit was in operation and enabled us to put the coal gas plant on a production basis which prevailed heretofore. This assured us of at least 50 per cent of our normal send-out in twenty-four hours, and also marked the approximate time of the flood height of the river, which was 39 feet; indicating about 8 feet of water in the boiler plant and substation and lower floor of the water gas plant.

Our next problem was to see what could be done in the water gas plant now that we had a steam supply available. Saturday night, March 21,

the water started to recede, so that by 2:00 A.M., Sunday morning, it was possible by using hip boots to get into the lower floor of the water gas plant and see what could be done towards producing water gas. By 8:30 A.M., Sunday, we had started a blast on No. 2 water gas set and by 10:00 A.M. the plant was in production at slightly less than the normal basis.

In the meantime fires had been started in our steam boilers, the water having receded to a point below the grates. Fuel was carried in baskets so that by noontime the boilers had been sufficiently dried out to put up to pressure and take the load.

The receding waters left a trail of damage of no small proportion. Over 6,000 yards of silt and sand had been deposited in the lower yard. A steam shovel, bull-dozer, and several trucks were acquired during the night so that on Monday, March 23, work of clearing our lower yard was under way.

The electric substation located at the gas plant to provide power and lighting being under 8 feet of water so damaged the motors and generator that the plant will probably be abandoned and such D. C. equipment as we retain will be relocated in the upper yard level.

Approximately 663 tons of coke were washed away, together with

3,000 gallons of water gas tar, 75,000 gallons of ammoniacal liquor and a Byers crane which was used in the coke field was also damaged beyond repair.

Distribution System

Friday morning, March 20, when it was feared that a shutdown might be inevitable, outside forces were assembled for the purpose of shutting off all meters in the territory and, if such a shutdown became necessary, restoring service as rapidly as possible. Fortunately this did not occur so the major portion of these forces were released on Sunday, March 22.

Throughout this period all bridges were continually patrolled, valves located and tried. This policy was a big factor in keeping large volumes of water out of the distribution system and shutting off the territory. The 12-inch main on the O'Leary Bridge in Lawrence, due to an adjacent waterfall, had been taking the continued battering from the debris that was coming over the Falls, several hangers were broken letting the line fall into the under-structure and come apart at the couplings. The valves had been closed shortly prior to this occurrence, keeping out large volumes of water that would have poured into our mains in the center of the Lawrence District.

On Merrimac Street, adjacent to the river, several large capacity meters in a manufacturing plant were broken away from their connections when this plant was flooded, water pouring into our 10-inch main through 4- and 6-inch services, thereby shutting off one of the main supply lines to North Andover. On Water Street the same condition prevailed, being restricted to a smaller area, however. A great deal of care had to be exercised in pumping out these mains, and the territories were constantly patrolled. As soon as conditions would permit these services were shut off so that escaping gas would not create a hazardous condition.

Our Service Department had been reorganized by means of acquisition of outside forces to the point where on Monday, March 23, it was possible to handle an increase of calls from our customers for restoration of service of over twenty times the normal number.

Distribution and service conditions improved rapidly so that by Thursday, March 26, it was possible to release all outside forces, and by the following Monday we were practically on a normal basis.

The value of holding company operation was ably demonstrated in this crisis. Large groups of personnel and equipment were available on short notice to rush into the territory and

augment the local forces in maintaining service.

Invaluable aid was rendered by employees of outside companies, particularly the Malden Melrose Gas Company who furnished us with equipment and a large group of all types of gas men, headed by Ralph Carter, superintendent. Without this aid our problem would have been exceedingly more difficult, if not impossible.

Last of "Old Guard" Is Dead



Frederic Egner

FREDERIC EGNER, the last of the "Old Guard" of the gas industry, died April 8 at his home in Washington, D. C., in his ninety-first year. Mr. Egner's passing marked the close of a most remarkable career. He had spent fifty-three active years in the industry and won a wide

reputation as a successful engineer.

Born in Germany, March 5, 1845, Mr. Egner came to this country in his early childhood. When one week past ten years of age, his lifework began as a boy laborer in a large factory at College Point, New York. Working ten hours per day and six days a week, his pay was one dollar a week. He learned the trade of machinist and by means of self-education acquired a fair knowledge of the steam engine—locomotive, stationary and marine. When 19 years of age he volunteered in the U. S. Navy during the Civil War, from which he was honorably discharged in 1866.

In the spring of 1872 Mr. Egner's long career in the gas industry began when he became an extra licensed steam engineer and general foreman of the works of the Metropolitan Gas Light Company, New York. He served successively with the following companies: New York Gas Light Company, New York, 1873; City Gas Company, Norfolk, Va., 1877; The Peoples Gas Light and Coke Company, Chicago, Ill., 1883; The Laclede Gas Light Company, St. Louis, Mo., 1883; Standard Gas Light Company of New York, 1890; City Gas Company, Norfolk, 1893. He was also president, manager and construction engineer at St. Charles and Moberly, Mo.; Taxarkana, Texas, and Fredericksburg, Va.

In 1891, Mr. Egner was president of the Western Gas Association. His last job in the gas industry was in Fredericksburg, Va., where he designed and erected a new gas works at the solicitation of the City Council.

Mr. Egner was possibly the best known of the engineers of the old gas industry. He always attended the conventions where he made many addresses and contributed many papers. He was a director of the American Gas Light Association and one of the organizers of the American Gas Institute. He was a pioneer in many gas engineering problems and inventions, and withal one of the leading gas engineers of his day.

For years he was an active member of the American Gas Association and maintained a lively interest in Association affairs until the end, corresponding frequently with various members of headquarters' staff.

Some of Mr. Egner's earlier experiences are recorded in the A. G. A. MONTHLY for March, 1934 in an article entitled, "A Glimpse into the Past of the Gas Industry."

Nelson A. McClary Dies

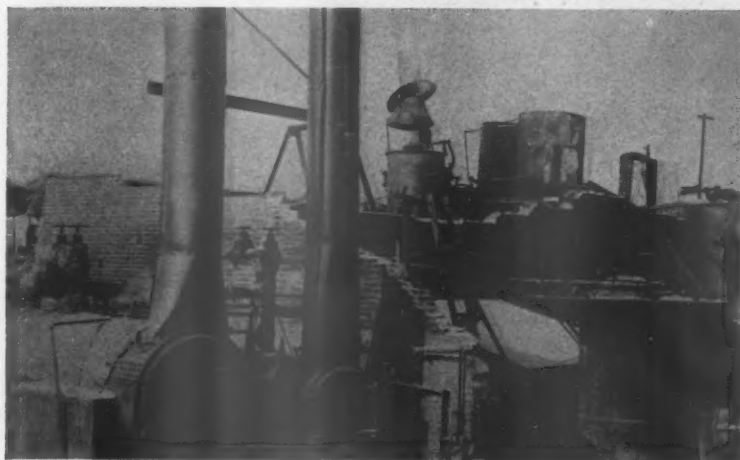
NELSON A. McCLARY, from 1895 to 1920 a well-known figure in the development of gas utilities in Chicago and Illinois, died April 9 at Empire, Mich. He was 79 years old.

Born at Albany, Vt., Mr. McClary was graduated from Dartmouth in 1884. He became general manager of the old Ogden Gas Company in 1895, serving until 1901. The famous "Ogden Gas deal" in which the company was bought by The Peoples Gas, Light and Coke Company occurred five years later. From 1901 to 1913 Mr. McClary was president of the Northwest Gas, Light and Coke Company. Until 1920 he headed the De Kalb County Gas Company and several other utilities.

Bertl Appointed

NE. BERTL, A. G. A. representative to the National Fire Protection Association, has been appointed to the Reception Committee for the fortieth annual meeting of the N. F. P. A. to be held in Atlantic City, May 11-14. The appointment was made by Percy Bugbee, chairman of the Reception Committee.

Gas Plant, Destroyed by Tornado, Resumes Operation in 2 Days



Anderson Gas Company plant as it appeared when operations were resumed, April 8

AT 10:05 o'clock, A.M., Monday, April 6, a tornado cloud sweeping eastward from Gainesville, Georgia, struck Anderson, South Carolina, carving a wide path of destruction and leveling to the ground the plant of the Anderson Gas Company.

Fifty-four hours later, at 3 o'clock in the afternoon of Wednesday, April 8, gas service was resumed in Anderson.

Although gas-manufacturing machinery stood in the open without so much as a shingle of shelter, surrounded by piles of crumbled bricks which once were walls, it coped efficiently with the emergency, supplying a tornado-torn city with an essential and warmly welcomed service.

Gas was actually lacking in Anderson only 50 hours, as supply tanks did not become exhausted until 12 o'clock noon, April 6. During the brief period of suspension, hospitals were supplied ample gas from tubes.

J. H. Rider, manager of the Anderson Gas Company, was uptown at the company offices when the twister struck. He immediately hurried to the plant on foot, climbing over uprooted trees and fragments of buildings along the way, and was greeted by a pile of wreckage and the odor of escaping gas.

Plunging into the tangled mass of



Wreckage of Anderson plant following destructive tornado, April 6

metal, girders and bricks, Mr. Rider located a valve and closed it, conserving such gas as remained in the tanks. This enabled the city to have gas two hours longer than would otherwise have been possible.

"On viewing the wreckage," Mr. Rider related, "I could not say whether service could be restored in two days, two weeks or two months. What I did know was the sooner the work was begun and the more men put on the job the shorter the delay."

Crews of specialists were rushed to Anderson from Sumter, Columbia, Augusta and Greenwood. Even before they arrived, laborers were engaged in clearing debris from the machinery.

By Monday midnight, in spite of torrential rains, wreckage had been piled to one side, permitting an in-

spection of machinery. It was found that some of the apparatus was badly damaged by falling walls, but not beyond repair.

Tuesday was spent in putting machinery in order, and early Wednesday morning the manufacture of gas was begun. During this time Mr. Rider did not sleep so much as a "cat nap"; he labored along with his men, eating his meals as he worked.

After informing gas users by radio and through the newspapers of safety measures, Mr. Rider ordered gas turned into the mains at 3 o'clock in the afternoon of Wednesday, April 8. Everything worked perfectly; not a single "incident" marred the procedure.

"The things most appreciated and most impressive was the fact that without an exception the public was most considerate," Mr. Rider commented. "Gas users, realizing the task with which we were confronted, quite willingly sacrificed comfort and convenience without complaint."

No one was injured in the collapse of the gas plant. Workers saw the tornado bearing down upon them and rushed out into the open, where they flattened themselves on the ground.

Definite Objectives in Gas Advertising

BEFORE discussing our company's current advertising it is necessary to point out that the same advertising is used by Los Angeles Gas and Electric Corporation, Southern Counties Gas Company and Southern California Gas Company. In Los Angeles the copy carries the signature of all three companies. In individual territory the copy carries the signature of the company in whose territory it appears.

If you read an advertisement of our company only occasionally you may have the impression that each one is an individual "inspiration"—that each week a group gathers around a table to ponder the question "What shall we advertise next week?" As a matter of fact, our advertising campaigns are laid out far in advance to attain definite objectives. Each piece of copy is designed to fit into the carefully prepared plan.

We know that the satisfaction a customer receives from the use of gas depends to a large extent upon his appliances. Worn-out, antiquated appliances deprive him of the full measure of convenience and economy that gas can provide. It is therefore in his interest, as well as ours, that we advertise to tell him about the modern appliance and to urge him to buy them. The company goes still further in its service by arranging for him to buy these modern appliances on very easy terms. But that is another story.

Part of our advertising is planned to remind customers of the many advantages of gas as a fuel. This type of copy is illustrated in specimens numbered 1 and 7 accompanying. Number 1 tells how natural gas contributes to the cleanliness of cities, while number 7 emphasizes its cleanliness in the kitchen.

Specimens numbers 2, 3, and 8 are signed by the Pacific Coast Gas Association, of which our company is a member. Number 2 is addressed to domestic cus-

By DOUGLAS BUCKLER

Southern California Gas Co.,
Los Angeles, Calif.

tomers and is run in *Sunset* magazine and women's club publications with a coast-wide circulation. Number 3 is addressed to gas appliance dealers and is run in various trade magazines. The purpose of number 8 is to tell of the advantages of natural gas for building

heating. The new Los Angeles Times Building is used as illustration. Each one of these is one of a series of similar type.

Specimens numbers 4, 5, and 6 sell gas appliances, but do not mention brand names. In these the buyer is directed to the dealer or gas company. Often this type of advertisement is surrounded by dealers' advertisements, mentioning specific appliances, and telling where they may be bought.

250 FRESH, CLEAN CITIES AND TOWNS
"the natural gas towns" of Southern California

no luxury
so inexpensive
no Economy
so Luxurious
so Instantly Available
HOT WATER

In a shade of MERCHANTISING SUCCESS

DOZENS OF TRIPS to the furnace each day... get plentiful HOT WATER for your use!

AN AUTOMATIC Gas WATER HEATER means constant supply

NOT MUCH SMOKE IN ONE CIGARETTE
"MORE AT ALL IN NATURAL GAS"

SINKS In a shade of MERCHANTISING SUCCESS

SOUTHERN CALIFORNIA GAS COMPANY

Gas Flame Decorates New Sales Floor



Full length view of sales floor, looking toward the rear

UNUSUAL color arrangements and the use of the gas flame in the decorative scheme combined to give the remodeled sales floor and offices of The Harrisburg Gas Company, Harrisburg, Pa., a new and distinctive appeal to the more than 6,000 people who attended the grand reopening, March 2-14, and the many who have since visited the company's offices.

The unusualness of this new home of the Harrisburg company is particularly apparent in the color arrangement of the sales floor. The walls are painted in four pastel tones of blue, topped by a light cream ceiling. Small sections of the walls at the front and back are painted with a slightly darker shade of ivory. Added to this color combination is a brilliant orange gas flame, in relief, at the top of each pilaster, and brilliant orange Venetian blinds at each window.

The floor covering is marbled black and white linoleum, the monotonous



Left to right: William H. German, office manager, Louis C. Smith, president, George B. Bains, 3rd, engineer, and George L. Cullen, sales manager

any of which is relieved by wide stripes of blue running from the foot of each pilaster to the corresponding pilaster at the opposite side of the room. In each of these blue stripes is a gas flame, repeating the decorative idea of the pilaster.

The cashiers' counter, in storied wood with metal stripping, is at the rear of the sales floor, in front of the office of the sales manager.

Modern indirect lighting with decorative fixtures completes the appealing, interesting ensemble in the unusual scheme. Equally modern and well appointed are the executive and other offices on the second and third floors.

The grand reopening was an outstanding success. Before the doors were



Miss Lois Crawford (left) of the Cribben-Sexton Co., and Miss Elizabeth M. Heldt, home service director of the Harrisburg company, on the demonstration platform

closed on the first night approximately 1,000 people had registered their attendance. This registration was secured through cards, which answered a two-fold purpose. They were used in the awarding of the attendance prizes—a full automatic gas range and an automatic gas water heater—and for the obtaining of information

on appliance use which should be exceedingly helpful in later sales contacts.

In addition to the two grand attendance prizes, there were daily prizes of prepared food and other products, and a room heater given to the one who guessed most nearly the number of persons who attended the two-week opening. And each customer was given a surprise packet, from a large grab bag, which contained a pad of Electrolux matches, a cook book, or some similar article.

A thoughtfully arranged program of demonstrations was conducted from a platform constructed, for the period of the opening, at the front of the sales floor. During the first week lecture demonstrations were held each evening.

Crowds View All-Gas Model Home

DESPITE inclement weather that prevailed at frequent intervals since the dwelling was opened for inspection February 29, nearly 30,000 persons have visited the F. H. A. all-gas model home, just off the Bronx River Parkway, near the Yonkers-Scarsdale line, Westchester County, N. Y. Interest in this dwelling has been running high, almost since construction work was begun, and it is expected that upwards of 100,000 persons will have inspected the interior by the time the exhibit closes on May 20.

Gas Air Conditioning Attractive

The fact that the 1936 model home has been well-publicized as the first sponsored "all-gas" house to be shown in Westchester County, is held largely responsible for the large attendance. Westchester Lighting Company, which supervised the installation of gas appliances, has had representatives constantly in attendance and the crowds, particularly over the week-end periods, have manifested great interest in the gas heating and air-conditioning equipment and the other gas-operated units, which include automatic water heater, refrigerator, kitchen range and clothes-dryer. Inquiries have been numerous concerning the different units and at times

visiting groups have been heard discussing them at length among themselves.

The model home, an attractive colonial residence, valued at \$15,000 will be given away at the closing of the Westchester Better Homes Exposition which is to be held in the County Center in White Plains, N. Y. from May 12 to 20. Preparations for this event are well under way and it is believed that it will attract another 100,000 visitors.

Situated in an attractive alcove in one corner of the basement, the warm-air conditioning furnace arouses much interest. Visitors, many from other states in the east, have marvelled at its compactness and its simple operation. They have commented favorably, too, upon the fact that the rest of the basement is given over to recreation space. In the present instance, this adjoining room is artistically fur-

nished even to the extent of a small bar and fixtures.

The gas water heater is only a short distance from the furnace, while a gas clothes-dryer forms part of the up-to-date equipment of the roomy laundry.

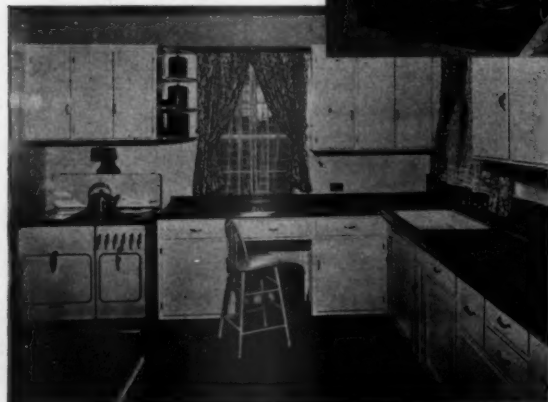
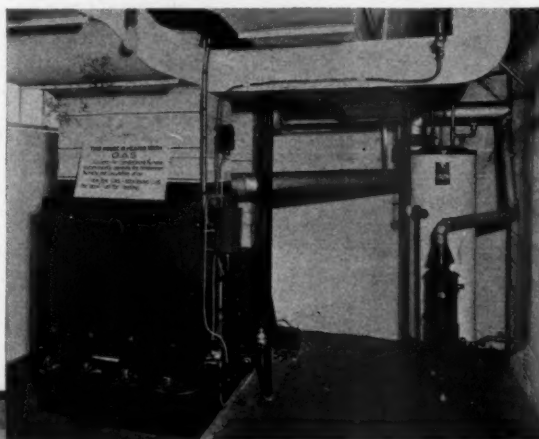
The kitchen is comparatively large and its gleaming white porcelain gas refrigerator and sparkling range, of the latest type in each instance, are marked features of the exhibit.

Another Gas Home

On April 17, another gas-equipped home was opened at Chilmark Farm, Ossining, Westchester County, N. Y. It is anticipated that around 50,000 persons will visit this place during the six weeks' period that the house remains open for public inspection. Gas is used for house heating, cooking, air-conditioning, and water heating in the Chilmark Farm Model Home.

That there is a decided trend to gas fuel for house heating is indicated by the fact that in recent months more than 525 homes in Westchester County, N. Y., changed from other fuels to gas and that hundreds of other home owners are considering this heating method.

In various parts of that county building developments contemplated and actually under way are featuring gas heating and air-conditioning.



Kitchen and exterior views of all-gas model home. Above—Basement alcove containing gas-operated heating and air conditioning equipment and automatic gas water heater

Stephen Smart Introduced at New Jersey Gas Convention



Feet in his slippers, pipe in his mouth
Let the wind blow from North or the South
Thermostats handy, mains full of gas
Stephen Smart's coal bin's a thing of the past.



Please Doctor, do not feel disgraced
No other one has filled your place
Ideal fuel is fine protection
Against the common winter infection



Stephen Smart now takes the bow
With ideal fuel he knows how
To heat hot water, cook and bake
And also to refrigerate



To Stephen Smart's bright domicile
The ideal fuel brought a smile
Shovels, cans and lifting pain
Never will come back again



I need hot water when I bathe
I need hot water when I shave
The ideal fuel fills the part
Says connoisseur Stephen Smart



Enjoying life and all that's good
Is Stephen Smart of Maplewood
The ideal fuel he declares
Relieves me of all household cares

Stephen Smart was among the newcomers at the twenty-fifth annual meeting of the New Jersey Gas Association at Asbury Park, N. J., on April 2. An amiable, intelligent, typical person of no great means, Smart appeared unofficially on the program to point out the advantages in the use of gas in the home.

Mr. Smart appearing pictorially, poetically presented in print his views on gas cooking, water

heating, refrigeration and house heating. His remarks were so well received that he has consented to appear on bill boards, on car cards, or in posters, should he be invited.

Above are pictures of Mr. Smart, and copies of his statements. It can be said for him that considering the brevity of his remarks, his unheralded appearance, and his modesty, he made an excellent impression on the delegates at the meeting.

Accounting for the Unaccounted-For

By J. B. BONIFACE

Public Service Electric & Gas Co.,
Newark, N. J.

UNACCOUNTED for gas has been a subject of interest for as long as there has been a gas industry. It sometimes seems to fit Mark Twain's comment on the weather. Everyone talks about it, but nobody seems to do anything about it. Of course, every distribution man will bristle at this comparison, but the writer has reference to one aspect of unaccounted for which seems to have been neglected.

The correlation between sales and sendout for short periods such as a month has not been thoroughly investigated, for the industry has been content to use a method to obtain the unaccounted for gas which gives quite erratic and sometimes misleading results. It will be found that in one month the unaccounted for may be 10 per cent while the following month it may only be 2 per cent, or even possibly negative.

The proposed method for comparing sales with sendout shows a seasonal fluctuation with no great difference between consecutive months. To illustrate how the methods of calculation work out, the per cent unaccounted for gas has been plotted in Figure 1, worked out both ways, for about two years.

By custom unaccounted for gas is the difference between the volume re-

corded at the works and the volume recorded by the consumers' meters for any month or multiple thereof. To obtain the percentage unaccounted for, this quantity multiplied by one hundred is divided by the sendout recorded at the works' meters. The sales volume so recorded is the summation of all the meter readings of that month. Where continuous meter reading is used, it is generally recognized that approximately half of this volume of gas is actually sent out from the manufacturing plants in the previous month, so that neither the sendout of the current month nor that of the previous month really corresponds to the sales reported for any one month.

The proposed method computes the sendout which corresponds to the sales in what is believed to be a theoretically sound manner and which results in a most interesting and consistent annual curve of unaccounted for. In passing it should be noted that using the old method of calculation for long periods such as a year the residual error is small and frequently may be disregarded.

In addition to the non-coincidence of

the sales and sendout month, the average number of days between meter readings for the month may be quite different from the actual number of calendar days of the month. In percentage this variation may be of the same order of magnitude as the unaccounted for. In the proposed method the effect of this variation is eliminated.

Once an accurate method for making monthly unaccounted for determinations became available some definite relation to outdoor temperatures was observed and this aspect has been investigated to some extent. Curves showing these relations are included in this article.

For continuous reading, so called, the consumers' meters are divided into approximately equal groups, twenty-one in number for the company in which this study was made, and each group is read at intervals varying from 28 to 33 days. The average interval between readings varies over a slightly narrower range. A typical schedule is included in the appendix.

To simplify our explanation we are going to make the following assumptions:

- (1) Each of the twenty-one groups of meters shall be replaced by one imaginary meter.
- (2) By reason of the existent diversity each of the twenty-one imaginary meters registers 1/21st part of the consumption of any one day.

With the foregoing simplified metering system before us we can proceed to the deduction of the relation between meter registration, i.e., sales and plant sendout.

On the first day of the meter reading period meter No. 1 is read. The gas sent out from the works which corresponds to this meter's registration since its previous reading would be the 1/21st part of the sum of all the daily sendouts since this prior reading. The gas sent out from the works corresponding to the registration of the meter read on the second meter reading day, would be again 1/21st part of the daily sendouts for each day since that meter was read previously. In

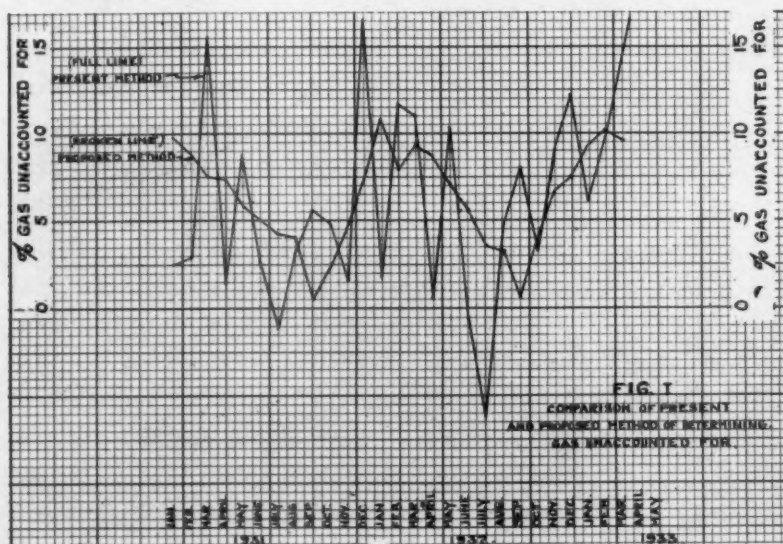


Figure 1

Contributed by the Technical Section, F. A. Lydecker, chairman, M. I. Mix, vice-chairman.

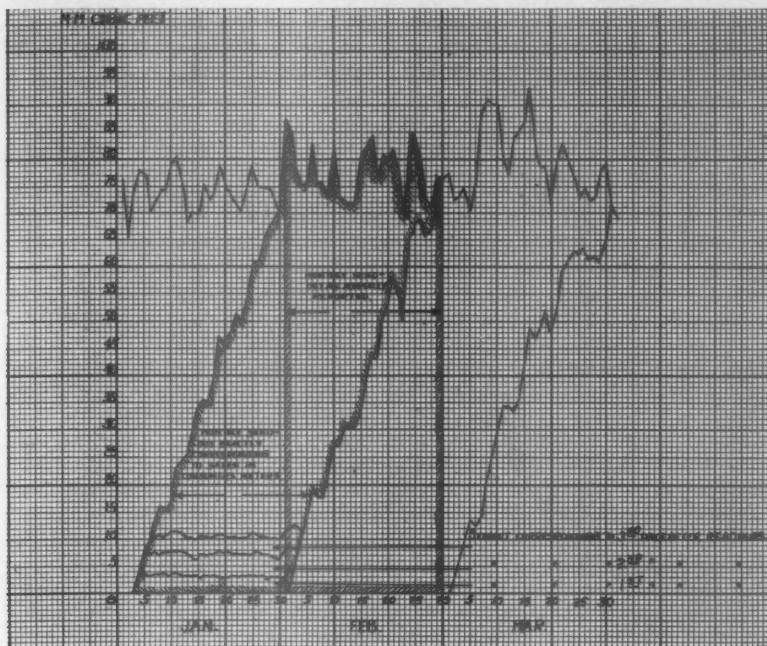


Figure 2—Graphical interpretation of sendout corresponding to monthly sales

like manner a sendout is computed for each of the twenty-one meters. The summation of these meter registrations is the sales reported for any one month and the sendout corresponding exactly to the sales will be the sum of these computed sendouts. Approximately half of the sendout so

computed will be gas actually sent out from the works in the prior month and about half in the current month of sales. A graphical interpretation of how the sendout comparing to sales overlaps in two months is shown in Figure II.

The sendout which corresponds to

sales calculated by this new method was determined for several years, after which the per cent unaccounted was determined. These data were plotted as in Figure III and were found to have a pronounced seasonal fluctuation. The monthly mean temperature, plotted on a reversed scale and about 15 days ahead of sales to allow for the lag in reading of meters, gave a curve markedly resembling the unaccounted for curve.

Obviously the next step was to determine the relation between unaccounted for and temperature.

The first attempt to plot temperature against per cent unaccounted for resulted in a rather discouraging scattering of the points. It was then found that there were two relations between temperature and unaccounted for. In the period of increasing outdoor temperatures, one curve fitted the points quite well while for decreasing temperatures a different curve better indicated the relation between temperature and unaccounted for. The original curves plotted early in 1933 for the years of 1931 and 1932 and prior to the cold winter of 1933-34, are shown as "A" curves on Figures IV and V.

During the cold winter just mentioned, the unaccounted increased and new curves have resulted (the "B"

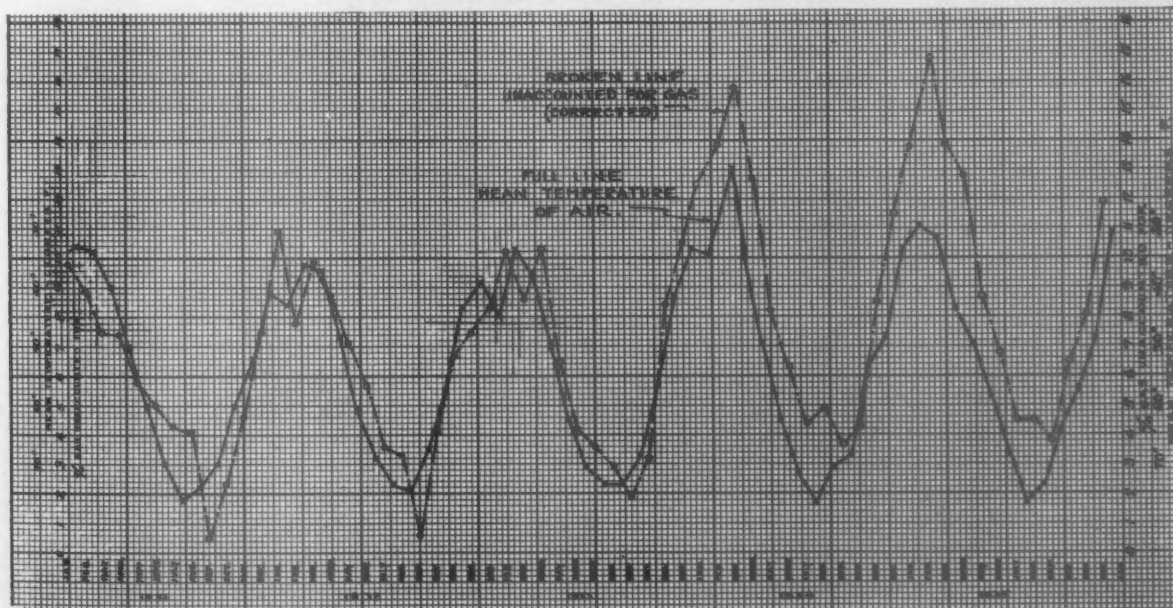


Figure 3—Comparison of gas unaccounted for with mean temperature

curves). Apparently the frost went deep enough that winter to disturb the underground plant substantially,

and hence to increase the leakage between 2 and 4 per cent. The theoretical contraction for cooling gas below

60° F. has been plotted as curve "C", and is approximately parallel to the experimental curves.

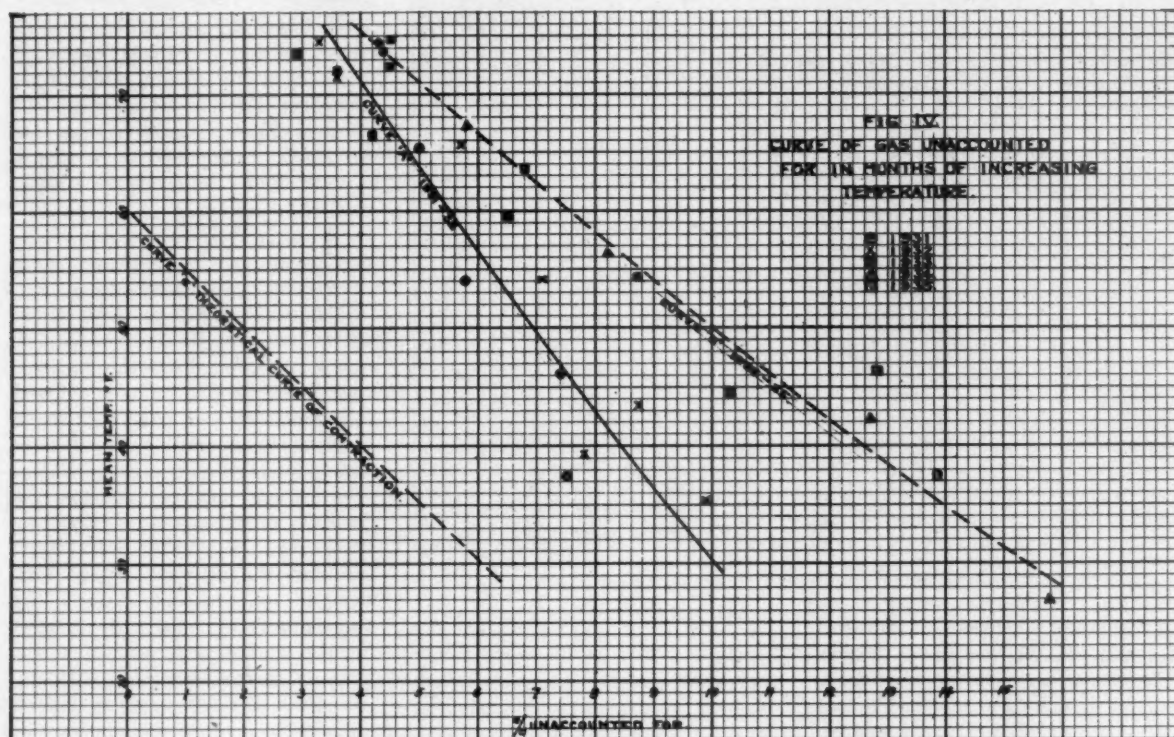


Figure 4

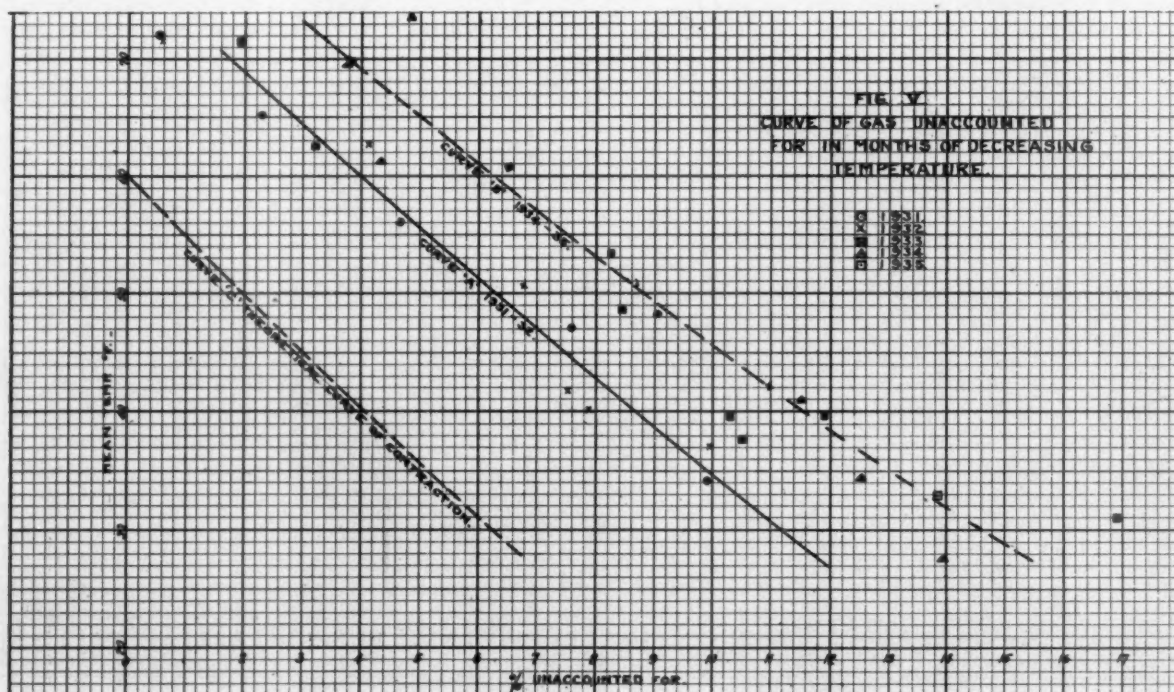


Figure 5

It will be noticed on Figure III that the month of September generally shows the lowest unaccounted for during the year. It is believed that re-evaporation of condensates takes place from the underground system during that month so that the volume of gas increases slightly in the distribution system.

In keeping a record of unaccounted for by this method any unusual changes can be quickly detected. Thus, during the cold weather of the winter of 1933-34, the unaccounted for gas was very high, as would be expected from the low outdoor temperatures. However, when the warm weather returned, the unaccounted for was found to be definitely higher than before for the same temperature. This was observable long before conventional computation methods made this fact certain.

This method of calculation should also make for interesting and possibly fairer comparisons between companies located in different latitudes. Thus, a northern company having a large space heating sendout should expect to have a substantially greater unaccounted for than a southern company having practically no heating load.

In the colder latitude, the mean temperature of the gas being measured in the consumers' meters would be lower, and with a heavy space heating load, a larger percentage of gas would

be sent out when the temperature contraction in the mains would be greatest, thus increasing the average unaccounted for gas on both counts.

In comparing the experience of different distribution systems, the send-out-per cent. unaccounted for gas curves would be determined and plotted, and the abscissae corresponding to the standard temperatures of measurement at the works would be the basis for comparison.

APPENDIX

Specimen Calculation of Unaccounted For Gas

There are certain short cuts which become evident, as computation of unaccounted for by this method becomes a routine matter and where there are twenty-one groups of meters the following calculation is typical.

A table of factors should be prepared consisting of the quotients of the division of one to forty-two divided by forty-two. On days in which meters are read, approximately half of the gas consumed that day, in that group of meters being read, is used after the meters are read, so that 1/42nd, 3/42nds, 5/42nds, etc., parts of the total are used for multipliers. On days when no meters are read, all gas used is read on subsequent days and 2/42nds, 4/42nds, etc., are required for multipliers. This material makes up Table I.

Let us assume that the unaccounted for gas for December 1935 is to be computed. The gas registered on the works' meters in November but read on the consumers' meters in December must first be calculated. According to the meter reading sched-

FACTORS FOR	CALCULATING SENDOUTS	EQUIVALENT
Meter Reading Day	Common Fraction Factors	Decimal Fraction Factors
1	1/42	.024
	2/42	.048
2	3/42	.071
	4/42	.095
3	5/42	.119
	6/42	.143
4	7/42	.167
	8/42	.190
5	9/42	.214
	10/42	.238
6	11/42	.262
	12/42	.286
7	13/42	.309
	14/42	.333
8	15/42	.357
	16/42	.381
9	17/42	.405
	18/42	.428
10	19/42	.452
	20/42	.476
11	21/42	.500
	22/42	.524
12	23/42	.548
	24/42	.571
13	25/42	.595
	26/42	.619
14	27/42	.643
	28/42	.667
15	29/42	.691
	30/42	.714
16	31/42	.738
	32/42	.762
17	33/42	.786
	34/42	.810
18	35/42	.833
	36/42	.857
19	37/42	.881
	38/42	.905
20	39/42	.929
	40/42	.952
21	41/42	.976
	42/42	1.000

(Continued on page 203)

METER READING SCHEDULE YEAR 1935

Route No.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	Average Days 1935	1934
January (a)	3	4	7	8	9	10	11	14	15	16	17	18	21	22	23	24	25	28	29	30	31	31.95	32.00
February	1	4	5	6	7	8	9*	11	13	14	15	16*	18	19	20	21	23*	25	26	27	28	28.67	28.81
March	1	4	5	6	7	8	11	12	13	14	15	18	19	20	21	22	25	26	27	28	29	28.71	28.57
April (b)	2	3	4	5	8	9	10	11	12	15	16	17	18	22	23	24	25	26	27*	29	30	31.24	30.86
May	1	2	3	6	7	8	9	10	13	14	15	16	17	20	21	22	23	24	27	28	29	29.00	29.38
June	3	4	5	6	7	10	11	12	13	14	17	18	19	20	21	22*	24	25	26	27	28	31.81	32.14
July	1	2	3	5	6	9	10	11	12	15	16	17	18	19	22	23	24	25	26	29	30	29.67	30.76
August	1	2	5	6	7	8	9	12	13	14	15	16	19	20	21	22	23	26	27	28	29	30.90	30.86
September	3	4	5	6	9	10	11	12	13	16	17	18	19	20	21	22	24	25	28	27	28	31.67	31.67
October (c)	2	3	4	7	8	9	10	11	14	15	16	17	18	21	22	23	24	25	28	29	30	29.95	29.48
November	1	4	6	7	8	9*	12	13	14	15	16*	18	19	20	21	22	23*	25	26	27	29	30.95	31.00
December	2	3	4	5	6	9	10	11	12	13	16	17	18	19	20	23	24	26	27	30	31	29.57	29.90

(a)—First reading day Thursday, January 3. (b)—First reading day Tuesday, April 2. (c)—First reading day Wednesday, October 2.

*—Indicates Saturday readings

Johns Hopkins To Graduate Gas Engineers in June

THE ninth graduating class of technically trained gas engineers will complete the course of instruction in the gas engineering course at The Johns Hopkins University, Baltimore, Md., in June, 1936. Following graduation the nine students in this year's class will be available for employment by companies who are in need of men thoroughly trained in the fundamentals of gas engineering. With the graduation of the 1936 class, a total of 66 will have completed the course since the first degree was awarded in 1926.

Those graduating in June who are available for employment are: Edward E. Gray, Annapolis, Md.; Leo Albert, Baltimore, Md.; John C. Brown, Baltimore, Md.; Leon H. Friedlander, Baltimore, Md.; George L. Kornmann, Baltimore, Md.; John Machek, Jr., East Islip, Long Island, N. Y.; William E. Miller, Baltimore, Md.; Howard B. Seim, Jr., Baltimore, Md.; Roy B. Young, Annapolis, Md.

Some of the students have gained practical experiences working for gas companies during their summer vacations. Complete information concerning any of the graduates will be furnished on application to Dr. Wilbert J. Huff, professor of gas engineering, The Johns Hopkins University, Baltimore, Md.

An untried idea twelve years ago, the gas engineering course has grown to be a substantial department of the University. Its purposes are: first, to educate young men for technical service who propose to make their careers in the gas industry; second, to carry on scientific research for the benefit of the gas industry as a whole; and professional research on specific problems of immediate importance to some company, or group of companies, under such arrangements as may be agreed to by the University and the company or companies concerned.

Three important research studies, which have been completed and published by graduates of the course, are: "An Investigation of the Manufacture of Water Gas with Especial Reference to the Decomposition of Steam," by Dr. Lloyd Logan; "The Removal of Hydrogen Sulphide from Gas by Means of Iron Oxide with Special Reference to Humidity Conditions," by C. Gordon Milbourne; and "The Origin and Decomposition of Organic Sulphur Compounds under Gas-Making Conditions with Particular Reference to the Role of the Carbon Sulphur Complex," by Dr. John C. Holtz.



1936 class in gas engineering—left to right, first row: G. L. Kornmann, J. C. Brown, R. B. Young, L. Albert and L. H. Friedlander

Second row: W. E. Miller, E. E. Gray, J. Machek, Jr. and H. B. Seim, Jr.

The curriculum offered in the four-year course gives broad training in the industrial applications of chemistry, with emphasis placed on gaseous fuel processing and utilization.

The courses completed in the four years' work include organic and inorganic chemistry, and elements of physical chemistry, qualitative and quantitative analysis, along with basic courses in physics, mathematics, thermodynamics and other mechanical subjects, and the elements of direct current and alternating current practice, drawing, surveying and strength

of materials. The specialized courses of the senior year include such subjects as heat generation and transmission, fluid flow, evaporation, distillation, and air conditioning, as well as the production of blue gas, carbureted water gas, producer gas, coal gas, oil gas, and natural gas, their purification, storage, distribution and utilization.

Gas companies are urged to establish scholarships in the gas engineering course in order that the student ranks, depleted by graduation, will be filled in the fall of 1936. Scholarships are usually based upon an expenditure of \$450 per year. This sum covers the cost of tuition, books and incidentals.

Heads Chamber of Commerce

S. C. SINGER, manager, northern division, Southern California Gas Company, Glendale, California, has been elected president of the Glendale Chamber of Commerce for the year 1936.

Fordyce Joins Bowser Service

CHARLES LESLIE FORDYCE, well-known industrial designer and consultant, has become an associate of the Bowser Service Corporation, who are moving into larger quarters at the same address, 51 Madison Avenue, New York, to accommodate their increased staff. Mr. Fordyce's work in various fields—furniture, metal arts, lighting equipment, glassware, ceramics, and silver hollow-ware—combines creative talent in design and practical knowledge of manufacturing processes.

McCarter Awards



W. Mooney



B. Grilli

AT staff meetings on March 3 and 17, President Conrad N. Lauer of The Philadelphia Gas Works Company, Philadelphia, Pa., presented McCarter awards on behalf of the American Gas Association to William Mooney and Benedict Grilli, respectively. At both of the meetings Walton Forstall, vice-president, introduced the candidates for the awards, citing their service with the company.

The awards were made for the successful application of the Schafer method of artificial respiration.

Mid-Continent Association Appoints Struth

H. J. STRUTH, consulting petroleum economist and publisher of Petroleum Economic Service, has been appointed statistician for the Mid-Continent Oil & Gas Association of Texas, with headquarters at Dallas, Texas. Mr. Struth served as special technical adviser to the Petroleum Administrative Board, Washington, D. C., and was later made secretary and district allocator for the Gulf Coast District by the Planning and Coordination Committee for the Petroleum Industry.

Dr. Becker Awarded Walton Clark Medal

ANNOUNCEMENT of those who will receive the 1936 medal awards of The Franklin Institute of the State of Pennsylvania, for scientific ingenuity and skill, for invention and discovery, was made April 24 by Henry Butler Allen, secretary.

Of particular interest to the gas industry is the award of the Walton Clark Medal to Dr. Joseph Becker, The Koppers Construction Company, Pittsburgh, Pa., "in consideration of his improvements in the art of carbonization of coal and manufacture of gas in coke ovens, and particularly for his work in the development of the oven known as the 'Becker Oven.'" The awards will be formally presented in the Hall of the Institute at its Medal Day exercises, Wednesday afternoon, May 20.

The Walton Clark Medal was founded in 1926 by The United Gas Improvement Company in honor of their chief engineer, who had been, for seventeen years, president of The Franklin Institute. It is presented not oftener than once a year "to the author of the most notable advance in knowledge, or improvement in apparatus, or in method, concerning the science or

the art of gas manufacture or distribution or utilization in the production of illumination or of heat, or of power."

The medal was last awarded in 1935 to Frederick J. West of Manchester, England, chairman and managing director of the West Gas Improvement Co., Ltd., and of West Gas Improvement Company, New York.

Tulsa Houses Summer Air Conditioned with Gas



Robert W. Hendee residence at Tulsa, Okla., which is air conditioned with gas during the summer

By EUGENE D. MILENER

Secretary, Committee on Industrial Gas Research

THE Tulsa residence of Robert W. Hendee, president of the Oklahoma Natural Gas Company, will soon complete its first year since being equipped for air conditioning with gas for all seasons. Of particular interest is the application of gas for creating comfortable living conditions throughout the summer.

Mr. Hendee's house was one of the first two to be equipped with the apparatus known as Air-O-Matic, which has been under development for several years. The feature of this system is an absorption refrigeration unit that cools and dehumidifies the air that is circulated by fans throughout the house. This unit is operated by low pressure steam that is supplied by a gas boiler. In addition to the supply of steam from the gas boiler, a supply of cooling water is used, and electricity is used to operate solution pumps in the unit as well as for operating air circulating fans.

These gas air conditioning installations were in operation throughout most of last summer. They are entirely automatic and tests under severe weather conditions indicate that the desired degree of comfort can be maintained throughout the entire summer at a very reasonable operating cost.

The extent to which absorption refrigeration units will become popular for summer air conditioning is being given some attention by gas engineers. The operation of these plants in Tulsa is being watched carefully because of the possibility of adapting this type of system to year 'round air conditioning with gas boilers supplying the heat energy during all seasons of the year.

Meat Roasting Tests

AN interesting series of meat roasting tests to determine the relationship of shrinkage to time and temperature of roasting were conducted during the National Restaurant Convention in Los Angeles in March, by the Natural Gas Bureau working in cooperation with the National Live Stock and Meat Board. The following report of these tests was taken from the Pacific Coast Gas Association's News Letter of April 14.

The tests apply particularly to commercial cooking of meats as done in restaurants and institutions using large roasts. Three tests were made and in each case meat from opposite sides of the same animal were roasted. The results show conclusively that roasting at temperatures of around 320° instead of the usual 440°, while requiring more time, results in improved flavor, less shrinkage and a remarkable saving in gas used.

In a typical test a roast of 16 lbs. 9 oz. was roasted at an average temperature of 310° for 4 hours and 22 minutes. Evaporation loss was 11.3 per cent and drippings 7.0 per cent. The oven was not preheated and 43.25 cu.ft. of gas were used. A similar roast (17 lbs. even) roasted at an average temperature of 449° for 3 hours and 13 minutes lost 20.4 per cent in evaporation and drippings were 9.9 per cent by weight. Oven preheating used 15.5 cu.ft. of gas and roasting 51.15 cu.ft. The saving in gas in favor of the low temperature process was 35.11 per cent. In both cases the final internal temperature of the roast was 140°.

Reynolds Elected President of Columbia Gas



E. Reynolds, Jr.

AT a meeting of the board of directors of the Columbia Gas and Electric Corporation, April 2, Edward Reynolds, Jr., was elected president to succeed Philip G. Gossler, who was chosen chairman of the board, a post vacant since the death of George W.

Crawford nearly a year ago.

Walter C. Beckjord, vice-president and general manager, was elected chairman of the executive committee, and Thomas B. Gregory, formerly senior vice-president, was appointed honorary vice-president of the company.

Mr. Gossler has been a senior officer of the Columbia company for 27 consecutive years, having been elected in 1909 chairman of the old Columbia Gas and Electric Company, W. Va., organized in 1906. He has served as president of the Columbia Gas and Electric Corp. since its organization in 1926.

Mr. Reynolds, who has been an officer of the system since 1922, has been executive vice-president since 1930 and will continue in charge of the company's financial affairs.

Mr. Beckjord, formerly with the Koppers interests, has been vice-president and general manager of the corporation since joining the organization in 1934, and will continue in charge of operations. He is a director of the American Gas Association.

American people spend almost eight hundred million dollars a year more for recreation and amusement than they do for fuel and light.

Affiliated Association Activities

N. J. Gas Association Meets at Asbury Park



W. S. Potter

NINE hundred persons attended the twenty-fifth annual meeting of the New Jersey Gas Association held on April 2, 1936, at the Berkeley Carteret Hotel in Asbury Park. The opinion is unanimously held that this meeting, presided over by the Association's president, H. E.

Cliff, was one of the best in the Association's history.

T. R. Crumley, president of Jersey Central Power and Light Company welcomed the delegates to Asbury Park. Mr. Cliff, after responding, reviewed the activities of the current year, pointing out the Association's usefulness to the industry in the State.

New Officers

The principal feature of the business meeting was the election of new officers. President for the coming year is William S. Potter, treasurer, Elizabethtown Consolidated Gas Company. Henry P. J. Steinmetz, general sales manager of Public Service Electric and Gas Company, and Robert W. Wiederwax, president of Atlantic City Gas Company, are first and second vice-presidents. George B. Webber of Public Service, was re-elected secretary and treasurer. President-elect Potter expressed the hope that the Association might extend its usefulness during the coming year.

Major Alexander Forward introduced Herman Russell, vice-president of the American Gas Association who presented a resume of the advertising and promotional activities now being carried on for the gas industry. Mr. Russell, on short notice, substituted for L. B. Denning who was originally scheduled.

The morning session concluded with a pictorial description of Camden Coke Company's new ovens. P. H. Winch, assistant superintendent of Camden Coke Company clearly outlined the innovations in the plant.

The afternoon session was devoted to sales. Harry A. Sutton of Public Service Electric and Gas Company, asked that the commercial gas load be given its share of attention. Sutton felt that this desirable and profitable business would respond in amazing fashion to the same type of intensive planning now being given the do-

mestic load. Howard H. Agee of Public Service, discussed the importance of rate structure in a sales program, indicating that lower rates do not automatically produce sales. Lower rates, however, are useful tools in the stimulation of sales.

The Mystery Chef appeared in person, first as a diminutive chef cutting up amusing capers on top of a gas range. In a more serious vein, he expressed his complete belief in the ability of anyone to cook, and cook well. He added that with automatically controlled gas, the operation becomes easier and more certain. The Mystery Chef presented the case for gas with conviction.

The remainder of the afternoon was spent in discussion of gas water heating. The subject was approached from five angles, each intended to show the way to greater sales. Lester M. Ginsburg, marketing consultant of Cambridge, Mass.,

pointed out the available market. With the use of charts, he showed that there are a large number of people in the income class to which gas should have an appeal, using other fuels. Of interest was his inference that too much time should not be wasted on the income group too low to be able to pay for automatic gas water heating.

Professor Gordon B. Wilkes, of Massachusetts Institute of Technology, discussed comparative costs of heating water with competitive fuels. He stressed the improved efficiency of water heating equipment that has virtually reduced the rate to a point where it will stand comparison under average conditions, with any competitive fuel. R. J. Canniff, Pittsburg Water Heater Company's sales manager, pointed out that all manufacturers are now increasing the efficiency of their water heaters and that within a year or two the poorest heater will be surprisingly efficient.

R. S. Christman, sales manager, The Philadelphia Gas Works Company, showed that gas companies had much to gain by a workable plan of plumber-dealer cooper-

Convention Calendar

MAY

- 5-7 Pennsylvania Gas Association
Lodge of Sky Top, Sky Top, Pa.
- 5-8 A. G. A. Natural Gas Convention
Baker and Adolphus Hotels, Dallas, Texas
- 11-12 American Management Association
Haddon Hall, Atlantic City, N. J.
- 11-14 National Fire Protection Association
Atlantic City, N. J.
- 20-21 Indiana Gas Association
Purdue University, West Lafayette, Ind.
- 21 A. G. A. Executive Conference
Hotel Traymore, Atlantic City, N. J.
- 25-26 A. G. A. Industrial Gas Section—General Commercial and Hotel and Restaurant Sales Symposium
Mayflower Hotel, Washington, D. C.
- 25-27 A. G. A. Production and Chemical Conference
Hotel New Yorker, New York City
- 25-28 National Association of Purchasing Agents
Roosevelt Hotel, New Orleans, La.

JUNE

- 1-4 Edison Electric Institute
Municipal Auditorium, St. Louis, Mo.
- 17-20 American Society of Mechanical Engineers
Dallas, Texas
- Wk. 22 National Association of Master Plumbers
Buffalo, N. Y.
- 22-26 American Institute of Electrical Engineers
Pasadena, Calif.

- 29-July 3 American Society for Testing Materials
Atlantic City, N. J.

JULY

- 6-8 Michigan Gas Association—Michigan Electric Light Association
The Grand Hotel, Mackinac Island, Mich.
- 6-9 American Home Economics Association
Olympic Hotel, Seattle, Wash.
- 8-10 Canadian Gas Association and Northwest Conference Pacific Coast Gas Association
Hotel Vancouver, Vancouver, B. C.

AUGUST

- 25-27 Pacific Coast Gas Association
Fairmont Hotel, San Francisco, Cal.

SEPTEMBER

- 7-12 Third World Power Conference
Washington, D. C.
- Wk. 30 American Transit Association
White Sulphur Springs, West Va.

OCTOBER

- 19-23 American Society for Metals
Cleveland, Ohio
- Wk. 26 A. G. A. Convention
Atlantic City, N. J.

NOVEMBER

- 9-12 American Petroleum Institute
Stevens Hotel, Chicago, Ill.

ation. Under such a program, competitors become allies, adding much to the sales volume. William F. Hope, of the Newport Gas Light Company, concluded the afternoon program with a plea that, forgetting alibis, but remembering the financial advantage, we go out and sell gas water heaters. His thoughtful, but highly amusing paper, found immediate response.

A feature of the program was the pictorial appearance of Stephen Smart, a fictitious character who, using catchy jingles, recommended the use of gas for various purposes.

Seven hundred persons attended the luncheon at noon, and five hundred enjoyed the banquet and entertainment offered in the evening.

Mid-West Gas Convention

H. M. SMITH, Iowa Public Service Company, Waterloo, Ia., was elected president of the Mid-West Gas Association at its thirty-first annual convention in Hotel Radisson, Minneapolis, Minn., April 13-15. He succeeds F. H. Brooks of Omaha, Nebraska. Over 500 delegates from Iowa, Nebraska, South Dakota and Minnesota attended the three-day session.

Other officers elected at the convention include, first vice-president, E. J. Boyer, Minneapolis Gas Light Company, Minneapolis; second vice-president, S. D. Whitman, Sioux Falls Gas Co., Sioux Falls, S. D.; and secretary-treasurer, R. B. Searing, Sioux City Gas & Electric Company, Sioux City, Ia.

The following were appointed to serve on the council for three years: A. L. Fritchey, Pittsburgh Equitable Meter Co., Des Moines, Ia.; F. J. Gunther, Iowa Nebraska Light & Power Company, Lincoln, Neb.; E. J. Otterbein, Peoples Light Company, Davenport, Ia.; and P. B. Thompson, Minneapolis Gas Light Company, Minneapolis.

J. T. Schilling, Des Moines Gas Company, Des Moines, and E. H. Viereg, Central Power Company, Grand Island, Neb., were appointed affiliation representatives of the A. G. A. in the commercial and accounting sections, respectively. L. J. Eck, C. S. Hoyt, and A. H. Abbott, all of Minneapolis, will continue as affiliation representatives of technical, manufacturers, and industrial sections.

Magill Assails Demagogues

Hugh S. Magill, president of the American Federation of Investors, Chicago, Ill., the featured speaker on the program, accused political demagogues of destroying millions of dollars in savings of innocent people while attacking the so-called "power trusts." He declared that the interests of the investor, the consumer and the public generally will be best served by investor-owned industry, privately managed and under just regulation.

Other speakers included George E. Frazer, of Frazer and Torbet; H. N. Ramsey, president of Welsbach Company, Gloucester, N. J.; F. C. Armbruster, Chicago; Robert L. Klar, Des Moines; C. H. French, New York; C. F. A. Scholdt, St. Paul; A. C. Grant, Minneapolis; E. C. Sorby, Rockford, Ill.; Paul Dorsey, Chicago; E. J. Boyer, and J. E. Swenson, Minneapolis.

Among the interesting demonstrations at the convention were the traffic tests of three cars driven with natural gas instead of gasoline. Delegates were invited to take rides in the cars around the city.

The cars were devised by Minneapolis engineers in collaboration with John K. Swanson, vice-president and general manager of the Minneapolis Gas Light Company.

Mr. Swanson was invited by managers of KSTP radio station to explain the workings of the test car after newsreel companies had taken pictures of the demonstration. In his radio talk, Mr. Swanson explained that the car was operated by compressed mixed natural gas, stored in tanks mounted on the car. It is under a pressure of 210 pounds and as it is pulled toward the engine its pressure is reduced to atmospheric pressure three steps by means of three governors.

Delegates also inspected a model pent house, designed to test heating efficiency of various fuels and to test temperature regulation equipment, and a model gas kitchen.

Success of the convention rests with the General Arrangements Committee headed by E. J. Boyer, and including C. F. A. Scholdt, Louis Stein, Charles Hoyt, J. E. Swenson, Chester Lyford and Amos H. Abbott.

The 1937 convention city has not yet been selected.

Indiana Gas Association

THE twenty-sixth annual meeting of the Indiana Gas Association will be held at Purdue University, Lafayette, Indiana, May 20-21. A number of prominent speakers are included on the tentative program released by P. A. McLeod, secretary-treasurer.

Following the opening remarks by President R. N. Zeek, and the secretary-treasurer's report, Dean A. A. Potter of Purdue University will deliver an address of welcome to the visiting delegates. This will be followed by a discussion on unaccounted for gas, led by Guy M. Johnson, general gas superintendent, Northern Indiana Public Service Company.

Of particular importance at the opening session will be a report by Professor Leckie on the work of Purdue's Gas Experimental Department. There will also

be a paper at this session on Evansville's experience since the introduction of natural gas to that territory.

John N. Shannahan will be the principal speaker at the informal banquet to be held during the evening of May 20.

The following subjects and speakers are on the tentative program for the final session: "Recapturing the Gas Revenue," A. V. Grief, vice-president, Gary Heat, Light & Water Co.; "Selling Gas Refrigeration in Columbus, Ohio," B. H. Gardner, director of sales, The Gas & Electric Appliance Co.; and a report of the Indiana Gas Association's Advertising Committee by C. V. Sorenson, sales manager, Public Service Company of Indiana.

Canadian Gas Association

AN interesting and practical program is rapidly being completed for the twenty-ninth annual convention of the Canadian Gas Association which will take place in Vancouver, B. C., July 8-10. The meeting is being held with the cooperation of the Pacific Coast Gas Association, and many delegates are expected from the United States as well as the eastern sections of Canada.

H. M. Crawford, president of the Pacific Coast Gas Association and general sales manager, Pacific Gas and Electric Co., San Francisco, Calif., will be one of the principal speakers at the meeting. He will discuss the future prospects of the gas business.

Other speakers and their subjects are: P. D. Mellon, Calgary, Alberta, "Storage of Natural Gas in the Bow Island Field"; D. E. York, Medford, Oregon, "Change-over to Butane-Air Gas"; Jessie McQueen, New York, N. Y., "Home Service"; J. Lightbody, Vancouver, B. C., "Modern Methods of Advertising Gas"; Ted Rosebaugh, San Francisco, Calif., "The Relationship of the Manufactured Gas Industry to the Oil Industry"; N. R. McKee, Los Angeles, Calif., "Putting Our Best Foot Forward"; and Julian Garrett, Edmonton, Alberta, "The Use of Temperature Statistics in the Gas Business."



Hotel Vancouver

Also included on the tentative program are: a special paper on Gas Sales by W. C. Mainwaring, Vancouver, B. C.; a technical paper by J. Kirkhope, Vancouver, B. C.; and a report on Emergency Inhalator Calls by an official of the Montreal Light, Heat and Power Consolidated, Montreal, Quebec.

A feature of the convention will be a playlet entitled "Selling a Modern Gas Range," presented by the Gas Department of the B. C. Electric Railway Company, Ltd. The delegates will also have an opportunity to visit Vancouver's first all-gas model home. A third special event will be the showing of a motion picture telling the story of natural gas, entitled "Twenty Million Years."

Headquarters will be at Hotel Vancouver.

Address Change

The Canadian Gas Association announces through its secretary, G. W. Allen, that following May 1, 1936, and for some months thereafter, the office of the Association will be located at 183 Glengarry Avenue, Toronto 12, Ontario.

New England Gas Association

THE operating division of the New England Gas Association will hold its spring meeting at the New Ocean House, Swampscott, on Friday evening, May 15, and Saturday morning, May 16.

The Friday evening agenda will cover six flood papers by men in the different New England areas most effected and will be so prepared as to afford the members the maximum of practical value. A seventh speaker will sum up the substance of the lessons to be learned as presented by the first six "regional" speakers.

The Saturday morning session will concern itself with 3 or 4 papers on various phases of production.

Mythical Gas System for "Research City"

GAS company men up and down the Pacific Coast are becoming interested in city planning. For some months the Research Society of the Los Angeles Gas and Electric Corporation has been organizing a gas company for mythical Research City, a California city of 30,000 people. At successive meetings of the Society the project has been planned, engineering reports submitted, financing arranged, rates studied and in fact all details essential to the promotion of a utility company discussed and argued.

While Research City is an interesting educational problem, Portland Gas & Coke Company's McKeeville and Washington Gas and Electric Company's New Roachville are serving as sales aids. These cities are being built from the ground up and populated with new customers. In New

Roachville there is \$965,000 worth of property to sell, a portion of which is assigned to each company district. Appliance sales count as property sales in accordance with a point system. The employee gaining the most points by May 29 will be elected Mayor.

—P. C. G. A. News Letter.

Southern Counties Gas Co. Marks 25th Anniversary

CELEBRATING the twenty-fifth anniversary of the organization of Southern Counties Gas Company, thirty-two members of the concern honored Ferdinand R. Bain, founder and present chairman of the Board with a "Silver Anniversary Dinner," April 13, at the Biltmore Hotel, Los Angeles. LeRoy M. Edwards, general counsel, acted as toastmaster.

In commemoration of the occasion, a tribute to Mr. Bain's faith in the business potentialities of Southern California and his vision in organizing the company was

paid by President Franklin S. Wade, who has been associated with the company since its inception.

Southern Counties Gas Company was organized by Mr. Bain in 1911, at which time the company's product was wholly manufactured gas, distributed to about 3,000 customers. Today the company serves 154,970 customers with natural gas from mains connected with practically all the gas producing oil fields in California.

Beginning in 11 small communities in Los Angeles and Orange counties with the service of manufactured gas from 7 small plants, the system now extends through five counties and serves more than 70 communities, including Santa Barbara, Ventura, Pomona, Whittier, Santa Ana, Venice and Santa Monica through 3,692 miles of transmission facilities.

As an interesting sidelight, records of the company disclose that transportation equipment in 1911 consisted of one horse and wagon, with one or two motorcycles and a few bicycles. Today a fleet of 380 automobiles and trucks is required to maintain service to present customers.

Coordination + Cooperation = Better Business

INVOKING that fundamental geometrical axiom, "the whole is equal to the total sum of its parts," G. A. Parker of Jersey Central Power and Light Company, Asbury Park, goes on to prove that the gas business is good or poor according to the total arrived at by adding together the efforts of its many and varied departments. This is the principal theme of an excellent paper by Mr. Parker which was awarded first prize in the recent Prize Paper Contest sponsored by the New Jersey Gas Association.

On the face of it, writes Mr. Parker, "the problem is one which calls for simple addition, but we are not totalling simple figures by any means. We must correlate the factors of conflicting yet interlocking duties; the unrelated but interdependent symbols of personal ambitions and ingrained prejudices; and the cold facts of necessity with the vagaries of human nature. When we have reduced or elevated these inextricably tangled parts to a semblance of order, we are ready for true Coordination and are ready to add Cooperation raised to the nth degree, which should, if correctly handled, equal Better Business, and that for all concerned."

As a point of beginning in the search for a solution of the problem, Mr. Parker considers the functions of the various parts and their interdependence as follows: "The Operating Department manufactures and distributes the product, and stands ready to maintain and measure service; the Accounting Department records the costs, and is

prepared to reckon the final profits or losses; the Commercial Department is in readiness to issue bills, receive payments, and hear the problems and wishes of customers; and the public relations personnel is on hand to prevent misunderstandings between public and private interest, and to arbitrate such difficulties as may arise.

But—now where are we? Everything is in readiness, from plant to meter, and back again. There seems to be something missing! And here we have, at last, a focal point, a place of beginning; the plus sign has been left out.

"This connecting link, the plus symbol, is represented in the gas utility business by the Sales Department; for the very nature of our commodity, gas precludes its use without the facilities placed before prospective customers by a sales force. Without this plus sign in the equation of utility service, that service stops at a non-usable point, and never completes its pre-conceived cycle."

At this point Mr. Parker takes up separately each department in a gas utility business, to see what relation each has to sales, and establishes a definite and inseparable relationship which is the center of the whole problem of Better Business. "Let management coordinate," he concludes, "so that employees as a body and as individuals can cooperate—and the Sales Department can and will be the string and positive plus sign to add both for the desired result—Better Business."



G. A. Parker

Accounting Section

F. L. Griffith, Chairman

H. W. Hartman, Secretary

E. J. Tucker, Vice-Chairman

Storage and Protection of Company Records

STORAGE—whether of fig leaves or food, clothing or records—has been a problem since the time of Adam. And in conjunction with storage, we must of necessity think of protection.

Many companies have reached a saturation point in the matter of proper storage facilities, while others are fast reaching that stage. This is particularly true in the case of public utilities where records abound and their preservation for a long period of time is an absolute necessity. In many instances it is becoming increasingly difficult to reconcile the schedule covering destruction of company records with the existing storage facilities, principally because the schedule never seems to permit the destruction of sufficient records to provide space to store the newer "old" records. The reasons for this, of course, are perfectly obvious to all interested in this matter.

One way to meet the requirements of additional dry, safe storage would be to construct new buildings—certainly an expensive method and not always practical.

Another method, and the one which we wish to present at this time, is a system of photography. It is known as RECORDAK.

This system was first put into use in 1928 when an installation was made in a New York City bank. Since then its uses in the commercial field have been recognized, and a number of the country's leading industries are now using this system.

The method consists of photographing, on regular films, such records as the company desires to store. These films are mounted on reels and furnished in lengths of approximately 100 feet. The number of records which can be photographed on one reel depends upon the size of the original record. The ratio between the original record and the photograph is about twenty-three to one. A very desirable feature of this system is that records of varying sizes may be photographed without changing or adjusting the photographing machine or mechanism. Then, when the record is projected onto the

By D. E. MALONEY
The East Ohio Gas Company, Cleveland,
Ohio

"screen" for examination, it is reproduced at standard size. If a copy of any record or report is desired, a positive is made from the negative on the reel—and the positive is the standard size. In one of the insurance companies where the Re-

The carton in which a reel is placed for storage measures about 4" x 4" x 1". A few simple comparisons will give an idea of the records of original size which can be stored on one reel.

Original Size	Negatives
3" x 5".....	4812
8½" x 11".....	2352
9½" x 10¼".....	2735
8½" x 14".....	1811



Exhibit A

cordak is in use, about 6,000 card records are "pulled" from the files each day. It is not actually necessary to take out of the files any of the original record cards, as all cards have been photographed. A positive copy is made from the film, and by a special time clock attachment, the date and hour at which the copy was taken appears on the record.

The Recordak equipment consists of two units, the photographing machine and the projector or reading device. (Exhibit A.) No highly trained technician is required to operate the equipment; any junior clerk can do so. While a very simple device, it is geared to accept documents at a speed of about 140 per minute.

The cartons in which these films are contained can be furnished with special printing, or labels can be attached thereto for proper marking and filing.

Reasonably priced steel cabinets or filing cases of almost any description can be adapted for storage of these films and will furnish ample protection from ordinary disintegration. One company estimates that it costs ten dollars a year to maintain a steel file, six drawers high, housing 12,000 cards 5" by 8". These 12,000 cards could be photographed with Recordak and permanently housed in three of the cartons. Exhibit B gives a graphic illustration of the space required for a group of records as compared with the space required for storage of a Recordak reel.

The films are nonflammable. The U. S. Bureau of Standards reports that if films are properly stored they will last about a thousand years.

The cost of the film is five dollars for 200 feet, and is developed for a cost of twenty-

five cents per hundred feet or fraction thereof.

In the newspaper industry, where the problem of storage is one of real magnitude, this system of photography is being rapidly adopted as it is ideally designed for use in that industry. It not only greatly reduces the storage space required, but permits the reproduction of any number of standard size copies from the negative copy on the reel.

From information obtained from various companies which have gone into the matter of storage and protection of records, with particular reference to the question of destruction of company records, it appears that the Recordak or some similar system



Exhibit B

will become in time an absolutely essential item of equipment. This is, as stated before, particularly true in public utility com-

panies, where governmental requirements in the matter of current and old records are so great. As an illustration of what can be done in this connection, we are advised by one of the leading utilities in the Middle West that the survey made in anticipation of a Recordak installation disclosed the fact that the records which they now have stored in a required space of 411 cabinets could be stored, if photographed on Recordak reels, in less than seven cabinets of similar size, a reduction in required storage space of over ninety-eight per cent.

A few of the large companies now using this method are Cities Service Co., General Electric Company, Recording and Statistical Corporation, and Western Union Telegraph Company. Also using it are many large department stores as well as a number of Federal and State Departments such as Veterans' Bureau, Vital Statistics, Motor Vehicle, Tax, Treasurers, etc.

Inasmuch as the photographic method of storing records is comparatively new, no

national precedent has been established for the unqualified acceptance or rejection of such records in court cases. There is available at the moment no information indicating the rejection of such records by a court; on the other hand, there are many cases on file in which the photographic record has been accepted without prejudice in court actions instituted by department stores and banks. It seems safe to believe that the rapidity with which the method is being adopted by industry will definitely establish universal acceptance, either on a "common law" or statute basis, in the not-too-distant future.

Rochester Yearbook Supplements Annual Report



Herman Russell

THE day when companies issued bare financial statements to cover their year's activities is rapidly passing if one can judge from recent annual reports of the Rochester Gas and Electric Corporation and other companies. In conjunction with and supplementary to its annual report

the Rochester company has printed a special yearbook edition of its magazine, "Gas and Electric News," which contains a complete description of the year's activities.

In the words of Herman Russell, president, the yearbook "is intended to furnish some of the background and color of the general picture out of which the financial statements have been crystallized. In this picture each company activity has its proper place. We trust that the recital of some of the romance and accomplishment will be interesting and inspiring. . . ."

The yearbook itself is attractively prepared and contains ample illustrations in addition to verbal descriptions of the company's activities. It deals with laboratory research, employees' activities, personnel, public relations, construction, gas manufacture and distribution, industrial, domestic sales, home service, rate and contact departments, and other activities. There are charts depicting annual sales and revenues and their divisions. For example, one chart shows the division of gas sales during 1935 as follows: residential, 61.1%; house heating, 13.7%; commercial, 10.8%; industrial, 13.8%, and municipal, .6%.

The annual report showed gas revenues for 1935 were \$3,911,596.82 as compared with \$3,925,166.28 in the preceding year. While residential sales declined, gas house heating sales increased \$57,044.00, and gas industrial sales \$20,893.00. Sales of gas ranges, water heaters and refrigerators showed substantial increases over 1934.

Credits and Collections To Be Discussed at Luncheon Conference

By **GEORGE WEBBER**

Public Service Electric & Gas Company, Newark, N. J.

LUNCHEON conferences of Accounting Section delegates have proven so popular at the last two A. G. A. conventions that this year five instead of the customary four meetings will be held. The newcomer on the list will be credits and collections, a subject that automatically generates fireworks whenever mentioned in a group of Accounting Section delegates. While succeeding issues of "The Monthly" will carry descriptions of each of the other luncheons, don't forget the credits and collections luncheon.

This subject has always been a problem in the gas business. While local conditions may play a large part in determining company policy, the industry has many fundamental credit and collection problems in common. The committee guarantees that the lively exchange of thoughts will give each person in attendance at least one good idea.

The subjects discussed at this luncheon will be chosen largely by the delegates present, but old familiar topics will probably reappear. Which is better for customer relations, a high or low outstand-

ing percentage? What part should the Collection Department take in the determination of customer credit? What is a reasonable chargeoff figure? What is happening on customer deposits? How about outside collection agencies? Are wage incentive plans gaining in favor, and why?



It is expected that a large number will attend this meeting. Since the abundance of thoughts and ideas will put time at a premium, a Major Bowes gong will be part of the equipment to keep any one person from talking too long. At least 40 persons will have an opportunity to say something to which others in the group will probably take exception.

While it is only May, you are urged, first, to plan to attend one of the luncheon conferences, and second, to attend the credits and collections meeting. That's where the fireworks will be set off. There's where the ideas will flow. There's where there will be not a single dull moment.

You will hear more about the time and place later.

Commercial Section

C. E. Bennett, Chairman

J. W. West, Jr., Secretary

F. M. Banks, Vice-Chairman

Gas Range Contest Theme of Film

COMBINING the duel theme of employee prospect finding and the national gas range sales contest sponsored by the Commercial Section of the American Gas Association, and a group of cooperating range manufacturers, the Standard Gas Equipment Corporation has released a new sound slide film, "Everybody's Doin' It," to aid the sales promotion activities of gas companies and dealers.

While carefully refraining from so-called high-pressure or forced selling, the film is a thoroughly enjoyable presentation of tactful and effective selling methods. It was prepared to help sales executives in their everyday problems of:

1. Stimulating the interest of employees in securing more leads or prospects by using the opportunities open to them every day in their work and social contacts. It dramatizes these opportunities by actual instances which show employees not only where their opportunities are, but also how they can take advantage of them.
2. Helping salesmen to do a better selling job by using the most advanced selling technique, that of selling in terms of benefits, rather than just selling a range. This method is also dramatized by two actual sales to difficult prospects, with different types of ranges, both in the showroom and the home.
3. Helping employees to learn more about the advantages of modern gas ranges, so that they can talk more interestingly and intelligently about them in their work and social contacts. It is anticipated that employees will absorb this information while listening to the salesman talk in the presentation.

The attention of employees and salesmen is gripped by a human interest story of a new office girl and a salesman which runs all through the presentation. The salesman tells the new girl about the National Gas Range Sales Contest, and how to use her opportunities to dig up leads and win a prize in the contest. These opportunities are dramatized by actual instances in which an office employee, cashier, service man and bill collector use their opportunities to get leads.

The film next shows how the new girl used a social contact to interest a friend in a gas range, and get her to come to the showroom with her reluctant husband, who said that they would not buy a new range. Following this is a sales demonstration on a modern gas range, using the sales

technique of selling the benefits, to the extent of influencing unconsciously the husband, who was shown some benefits to him. This part of the story ends with an order being signed by the husband in the showroom.

Other scenes show the salesman making a sales demonstration in a prospect's home and completing a sale under extremely difficult conditions, and, of course, a happy ending to the human interest story.

A feature of the presentation is a sixteen-page booklet which gives in condensed form over fifty of the scenes and dialogues,

and is intended to be handed to every employee who attends a meeting. It is not intended for general distribution. The purpose of the booklet is to help those who attended the meeting to remember the suggestions made and opportunities pointed out in "Everybody's Doin' It" and to give them further chance for study. It should prove helpful to salesmen who are interested in improving their selling technique and raising their percentage of sales to prospects.

The presentation takes about half an hour and is suitable for any type of organization. Showings of "Everybody's Doin' It" are now being scheduled by representatives of Standard Gas Equipment Corporation.



Scenes from the film, "Everybody's Doin' It"

"The Heart of the Home"

FURTHER proof that modern gas appliance merchandising leaves no step untaken to provide the salesman with the best available tools is seen in the recently released slide film of the American Stove Company. The first production, entitled "The Heart of the Home," is designed to take the place of a comprehensive sales training school for those selling modern gas ranges. The production is being shown in various stores and gas company salesrooms throughout the country.

The picture shows simply, concisely and step by step a proven way of selling gas ranges. It shows many important features which women look for and demand to make their cooking task easier, more convenient and less time-consuming. It also shows how these features have been developed in the research laboratory.

"The Heart of the Home" requires 30 minutes to show and is expected to be of material aid in increasing the sale of ranges during 1936.

Regional Sales Conference Opens May 21

THE 1936 Regional Gas Sales Conference covering the states of New York and New Jersey and nearby territory will be held May 21-23, at Lake Mohonk Mountain House, Lake Mohonk, N. Y.

George Ostlund, chairman of the committee in charge, announces that an interesting and helpful program of outstanding speakers has been arranged.

The first session will be held Thursday night, May 21, and the final one Saturday morning, May 23. A special feature of this

year's program will be the Friday afternoon symposium of moving picture films and slide films, and the demonstration of the manufacture of gas by C. R. Banes utilizing the model gas plant of the Long Island Lighting Company.

Reservation should be made directly with the Lake Mohonk Mountain House, Lake Mohonk, New York, as accommodations are limited.

To Hold Summer Sales Conference

THE summer sales conference sponsored jointly by the New England Gas Association and the American Gas Association will be held during the month of June at Swampscott, Massachusetts, probably on June 18-20.

The committee in charge is preparing a program of excellent speakers on pertinent topics pertaining to the sale of gas and gas appliances.

R. J. Rutherford of the Cambridge Gas Light Company is chairman of the conference. Details of the program will be published in the next issue of *THE MONTHLY*.

Sales Contests in Full Swing

WITH three sales contests going on simultaneously Commercial Section Headquarters is operating at top speed to keep track of the registrations and reports of more than 1,000 companies registered in the range, refrigerator and water heater activities.

There are 358 companies registered in the Water Heater Contest and 247 in the Range Contest. The Refrigeration Contest which started on April 1 shows a greater participation than in any previous year with about 10 per cent increase in the meters represented by registered companies.

Some very high sales records have already been reported for individual salesmen. Announcement of February prize winners in the Range and Water Heater Contests was delayed in order to give companies operating in the flood districts an opportunity to report their sales. Prize winners for the month of March will be announced before this issue of *THE MONTHLY* is received and monthly announcements in the future will occur on or before the 20th of each month.

Cash awards in these three contests total approximately \$75,000 and include monthly awards for individual salesmen and to those salesmen making the best record during the entire contest, as well as special company awards for the showing of the companies as a unit. There is still a large amount of money to be awarded in each contest and the registration date is being held open indefinitely so that non-registered companies may still have a chance at the winnings. All companies not yet registered are urged to send their registrations promptly to J. W. West, Jr., Secretary, Commercial Section.

Housing and the Gas Industry

THAT the British gas industry has a vital interest in raising the housing standards in that country was brought out at the Silver Jubilee meetings of the British Commercial Gas Association held at Cardiff, March 5. The following interesting sidelights were reported in *The Gas World*, London, March 14:

Speaking on the subject of "Housing and the Gas Industry," Sir Percy Alden, chairman of the British Institute of Social Service, said that for over forty-five years he had had experience of working-class housing, and during that time he had been able to trace a continuous improvement, owing chiefly to the fact that the standard of comfort generally had risen and that all housing authorities—public or private—had been compelled to recognize that higher standard.

The importance of good housing could hardly be exaggerated. In some respects it was more important than the problem of unemployment, for until the last two decades the problem of unemployment had been cyclical and spasmodic, and therefore to some extent transitory, while the housing problem, on the other hand, was the heritage of many generations, and often an evil heritage. The ills arising from insanitary housing were cumulative and accounted for much of the disease that filled the hospitals and the heavy death rate of the big industrial centres.

Gas Gains Ground

Gas was invaluable for ventilating purposes, prevented the pollution of the atmosphere and was clean, economical and easily handled. Gas was not losing ground, but was making headway all the time. Wherever gas undertakings were given the opportunity of competing with electricity they carried the day so far as heating and cooking were concerned.

Gas ensured the use of amenities and comforts which their forefathers never possessed and had made life more bearable. He wanted the industry to do all it could to raise the standard still higher, so that they might have healthy, contented and prosperous citizens.

In the discussion which followed Sir Francis Goodenough declared that the compulsory use of electricity caused people to revert to the use of crude coal, with its consequent pollution of the atmosphere.

Sir Reginald Clarry, M.P. for Newport, remarked that in the face of the fiercest competition, the industry was doing very well. He issued a warning against the assumption of a state of satisfaction, and said that in the magnificent work done on behalf of the country no individual was more responsible for the enterprise shown and the achievements attained than their chairman, Sir Francis Goodenough. They

congratulated Sir Francis heartily upon attaining his jubilee as chairman of the association.

Sir Francis Goodenough, responding, said he was glad to say that the gas industry was never in better health than it was today—and he spoke from 40 years' experience of the industry, in good times and in bad.

Last year three new records for gas were made. The consumption was higher than ever before; the number of consumers rose to eleven million; and the turnover of gas appliances reached a new high record.

The amazing progress of the industry was due in no small measure to the work of the British Commercial Gas Association.

Since they first began cooperative advertising in the newspapers, the number of gas consumers had increased by 70 per cent, and it was no wonder that other industries had followed their example! Not only in advertising had they taken the lead, but the gas industry was the first British industry to organize training for salesmanship on a national scale.

The problem of the gas industry today—as of most industries—was not efficiency of production, but efficiency of distribution. The main effort required today was to improve their methods of marketing and service, and to make profits by discovering new and better ways of serving customers, and by telling them about their service in the most attractive way they could.

R. A. Lawder Appointed Sales Manager

ROBERT A. LAWDER, who has been assistant manager of the house heating and air-conditioning division of the Consolidated Edison Company of New York, was promoted on April 2 to sales promotion manager, a newly created position, according to an announcement by George Ostlund, general sales manager.

Mr. Lawder has been connected with the sales department since he joined the company in 1931 as a salesman in the house heating division. He was transferred to the East River Gas Company in 1932 as sales supervisor, and in January, 1933, he became a retail district supervisor. In July, 1935, when the house heating and air-conditioning activities were combined, Mr. Lawder became assistant manager of that division.

Correction

IN the story on gas heat at Navy Pier, Chicago, which appeared in the April issue of the *A. G. A. MONTHLY*, the gas meter was erroneously referred to as a Connersville rotary orifice meter. The meter is a Connersville positive displacement meter.

Industrial Gas Section

Charles W. Gale, Chairman

Eugene D. Milener, Secretary

Ralph L. Manier, Vice-Chairman

General Commercial and Hotel and Restaurant Group To Meet in Washington, D. C.

DUE to the great similarity of the problems faced by both groups, and to the fact that in many gas companies the same salesmen handle both classes of customers, the Hotel and Restaurant Sales Conference and the General Commercial Sales Conference will be combined this Spring. This joining of forces will take place Monday, May 25 and Tuesday, May 26, at the Mayflower Hotel, Washington, D. C. The conference is under the auspices of the Industrial Gas Section.

This sales conference is particularly timely. Probably at no other time have there been so many new and improved hotel, restaurant and lunch room gas appliances as there are this year. Many new commercial gas appliances have recently been brought out and others have been improved. Competitive conditions are such that a first-hand knowledge of all of these devices is necessary for any sales force that is ambitious to connect a quantity of them to their gas lines.

Emphasis on Selling

But equipment studies will be only a part of this joint sales conference. As its name implies, chief emphasis will be placed on studying and demonstrating successful methods of selling gas and gas appliances and keeping them sold to business places and eating establishments. Men who are experts in their chosen fields will explain the reasons why they have been successful in selling gas to some businesses that might be causing men in other gas companies particular trouble. Ample time will be provided for discussion.

The conference will be the only one of its kind to be held this year. A large attendance from both natural and manufactured gas territories is expected. The tentative program is as follows:

- Opening Address on the Business Phases of Selling.
- Organizing a Department To Handle All Commercial Sales.
- Selling Year 'Round Air Conditioning with Gas to Modern Restaurants and Commercial Establishments.
- Creating a New Approach to Commercial Selling and Bettering Customer Understanding.
- Sales Possibilities in Several Important Commercial Fields.
- Successful Displacement of Competitive Fuels in Commercial Cooking Operations

- (1) Oil and Coal Phases
- (2) Electric Phases

Conducting a Cooperative Replacement Campaign for Commercial Gas Appliances.

A Successful Method of Selling Cabinet Gas Ovens to Small Retail Bakeries.

The Counter Cooking Load—How To Build for Future Sales.

Selling Satisfactory Gas Water Heater Service to Commercial Customers.

What the Hotel Man Thinks of Gas Service.

Closing Remarks and Comments—This Conference.

There will be a luncheon Monday at which a prominent gas executive will speak on a subject that is particularly important at this time. Tuesday's luncheon will be informal and will give those attending the conference an opportunity to get better acquainted and discuss mutual problems more fully.

A meeting of the Managing Committee of the Industrial Gas Section will be held in conjunction with the sales conference.

Plans for the conference have been made by H. A. Sutton, chairman of the General Commercial Committee, C. E. Lucke, Jr., chairman of the Commercial Cooking and Baking Committee, and T. M. Offutt, Washington Gas Light Company.

News of INDUSTRIAL GAS PUBLICITY

Among the interesting articles prepared under the auspices of the Publicity Committee of the Industrial Gas Section and which have appeared in prominent industrial magazines recently are those described below.

The technique of salvaging steel scrap for important uses with the aid of gas-fired furnaces, as carried on at the Altoona, Pa., shops of the Pennsylvania Railroad, was described recently in the trade press. This article "Forging and Heat Treating Locomotive Parts," which appeared in *The Iron Age*, March 19, and *Steel*, March 23, explains in detail the forging and heat treating practices as well as the equipment employed in these shops, which are among the largest in the world.

How the Chevrolet Motor Co. increased production 550 per cent at its Saginaw, Mich., foundry is told in a nine-page article in the March issue of *Mill and Factory*.

An article in the April number of *Railway Mechanical Engineer* describes the various gas-fired furnaces employed in forming and heat treating car and locomotive springs at the Altoona shop of the Pennsylvania Railroad.

"Processing of Enamel Wire" (*Industrial Heating*, March), is the title of an article describing modern, high speed wire

drawing methods (6,000 ft. per min.) and numerous gas-fired furnaces used in finishing the wire.

Bringing a pretzel plant up to date by changing bake ovens to gas fuel and adding conveyors is the theme of an article "Pretzel Baking Modernized" published in the January issue of *Food Industries*. "Distilling Pine Products at New Orleans" is the title of an article which tells about changing 48 retorts over to gas firing. Later improvements in the burning equipment effected a 25 per cent decrease in gas consumption for the same amount of work. The power plant was also converted to gas firing. The article appeared in the January issue of *Chemical and Metallurgical Engineering*.

"Waste in business has ever been elusive, but the increasing pressure on operators of hotels, restaurants and institutions has made them more keenly alert toward waste reducing equipment than at any time in history. Any dealer who is not capitalizing on this by talking kitchen modernization is neglecting a splendid opportunity," is the opening paragraph of an interesting article in the *Institutional Outfitter*, February. Written by C. E. Lucke, Jr., chairman, Commercial Cooking and Baking Committee of the Industrial Gas Section of the American Gas Association, this is the leading article in the magazine and goes on to tell of the intensive modernization program in gas range and other commercial cooking equipment design.

Gas-Fired Radiant Tubes as Applied to Controlled Enameling and Other Atmosphere Furnaces

By H. C. WELLER*

Vice-Chairman, Ceramic Industries Committee, Industrial Gas Section

CONTROLLED atmosphere furnaces have been in use for many years, and, as the name implies, are amenable to maintaining any desired or predetermined atmosphere necessary to control the influence of this atmosphere upon the work in the furnace. Physical appearance and quality of the finished product are, in a large measure, contingent upon required atmospheric conditions, the peculiarities of which demand that heat must be applied with great precision. Furnace efficiency and fuel consumption expressed in terms of output is the only criterion influencing the purchase of a furnace or kiln from the plant operator's viewpoint, provided, of course, all other conditions, such as required atmosphere, method of handling material and ease of operation, are met. It would be trite to attempt a segregation of the furnace from the fuel used in its operation because of the principal object involved—the liberation of the potential heat in the fuel and its proper transfer to the work to be heated.

Furnace Atmospheres

The general situation regarding atmosphere furnaces logically refers to gas- or oil-fired muffle-type furnaces, electric furnaces and radiant tube furnaces.

Protective muffles are used in heating processes where the products of combustion may tend to influence the proper atmosphere and its effect upon the physical characteristics of the ware in the heating chamber. As a rule, refractory muffles are not impervious and any attempt to force production through a furnace above its rating will result in back pressure within the combustion chamber, thereby forcing some of the combustion products into the heating chamber. The heat capacity of a muffle varies with its size, construction and material used. Large muffles are difficult to maintain and leaky muffles with their deleterious effect upon the ware are quite costly in operation. The muffle floor abstracts heat but its temperature is very high and the temperature difference too low to permit rapid heat transfer by convection and particularly by radiation. Thermal efficiency of a muffle furnace will largely depend on design and mode of operation. Since a very high temperature working head is required for rapid heat transfer to the furnace chamber proper, it follows that all heat generated at temperatures higher than the actual furnace temperature is wasted unless special provisions are made for waste heat recovery.

Electricity has no waste products of com-

bustion and this fact has given rise to the erroneous conception of freedom from harmful furnace atmosphere. Work charged into an electric furnace is charged practically into room atmosphere, containing about 20% free oxygen but it is not quite possible to operate the furnace under this condition unless special means, such as circulating fans, vents or induced air, are provided to maintain an oxidizing atmosphere. For example, if the work charged into an electric furnace is oily and no fresh air is allowed to circulate, it is possible to soon find a highly reducing atmosphere within the furnace chamber. "Gassy" electric furnaces are known to exist when the displacement of air occurs by volatilization of gases from the ware passing through the furnace or from the occurrence of water vapor from improperly dried ware in enameling or other ceramic furnaces.

In the light of these and other similar instances, it seems reasonable to assume that for certain given heating operations the atmosphere within an electric furnace possesses most of the disadvantages of the ordinary refractory muffle-type furnace.

Thermal Efficiency

The thermal efficiency of an electric furnace is normally much higher than that of a fuel-fired furnace. This difference is represented by the amount of heat which is carried away from the furnace in the waste products of combustion. Identical thermal efficiencies would be obtained if waste heat utilization were carried to the economical limit. It follows that the obviously ideal application of electricity is most attractive in the high temperature field, such as alloy melting where the inherent form value of electricity as a fuel contributes greatly to the necessary metallurgical control over the constituents of the metals.

The cost of furnace operation, however, points definitely in favor of gas fuel for heating operations within normal temperature ranges. Definite economic limitations in rate developments in the power industry will not greatly change future conditions from those existing at present except in such localities where abundance of natural power with the least amount of invested capital exists.

Also the "come-back" of muffle-type or electric resistor-type furnaces for in-and-out operations is slow as compared with the fast "pick-up" of radiant gas tube-fired furnaces, where the amount of effective

B.t.u.'s transmitted to the work from the individual tube is appreciably higher per unit of exposed radiant surface.

The advantages of radiant tube firing will, in their aggregate, necessarily affect the operating costs and output of a furnace under given operating conditions. After the final analysis is made, it is usually found that economy in operation, day in and day out, involves much more than mere thermal efficiency.

Shut-downs caused by short-circuits of ware with electric heating elements are costly and may tie up production. The necessity of paying demand charges whether the furnace is operated or not and the ever-prevalent need of keeping the throughput at a high level due to the initial cost of purchasable heat units per dollar add materially to the overall cost of electric furnace operations. With gas-fired radiant tubes, there is no standby charge for fuel, no danger of unexpected shut-downs. All we expect of radiant tubes is for them to lie there and transmit heat to the work in the furnace.

Radiant tubes are made of heat-resisting alloys and can be cast in any commercial shape or form to comply with specifications set up for a given furnace. Chromium-nickel alloys containing about 25% chromium and 12% nickel hold their strength remarkably well at temperatures up to 2100° F. and when exposed to oxidizing atmospheres, to sulphur and oxides of nitrogen, show no indication of surface deterioration. Heat-resisting alloy parts, such as pushers, rollers, conveyors, have been successfully used in heating furnaces for a good many years with excellent results as to the life of such parts. None of the severe operating conditions, successive heating and cooling, abrasion, load stresses, etc. are asked of radiant tubes and although their application as mere heating agents is comparatively new, the life expectancy is considerably increased over moving alloy parts. Cast-alloy radiant tubes have been in operation for over two and one-half years without indications of surface oxidation and no replacements will be required for a long time to come.

Application of Gas Radiant Tubes

Perhaps the most striking development in the ceramic industry has been the adaptation of radiant tubes to vitreous enameling. The Committee on Industrial Gas Research of the American Gas Association recognized the possibilities of the application of radiant tubes to the firing of enamels, thereby combining the advantages of electric heat with the advantage of lower fuel cost in operation. As a result of analytical studies pertaining to specific re-

Part of paper presented at annual convention, American Ceramics Society, Columbus, Ohio, March 29-April 4, 1936.

*Surface Combustion Corporation, Toledo, Ohio.

quirements for the enameling process, Surface Combustion Corporation was retained by the committee to design radiant tubes and convert a standard, gas-fired, box-type muffle furnace at the Detroit-Michigan Stove Works.

It has been conceded that the ideal furnace for firing vitreous enamel should fulfill the following conditions in normal operation from the standpoint of quality of finished product and rate of production:

First, uniform temperature distribution and accuracy of heat control.

Second, freedom from harmful furnace atmosphere.

Third, short heating and cooling cycles.

Fourth, low cost of operation per unit of ware fired.

With the exception of the last two points, electrically heated enameling furnaces have, as a rule, met these requirements and many electric furnaces were installed for just two reasons,—ease and simplicity of operation and accuracy of heat control.

"Gassy" Electric Furnaces

We have seen that it is quite possible to have "gassy" electric as well as fuel-fired furnaces, although it is obvious that this difficulty results from different sources. Fuel-fired muffle furnaces will permit leakage of combustion products and the presence of concentrations of CO gases and water vapor prove harmful to quality finish. In electric furnaces the source of "gassy" furnaces and the ensuing difficulties such as blistering, copper heading and scumming are chiefly due to improper or insufficient drying of the ware preparatory to firing, and during the firing process the presence of emanated acid gases from the enamel. In addition to contaminated atmospheres, difficulties in firing may arise, especially in continuous furnaces, from excessive preheat temperatures prior to the fusion of ground coat due to the formation of excessive iron oxide affecting proper bonding. Adequate venting and gradation of temperatures within the furnace will usually assist in securing satisfactory operating conditions. The fact remains, however, that these difficulties are not partial to any particular fuel or furnace.

The economic aspects, maintenance and cost per square foot of ware produced, will today in most cases decide the selection of a new furnace or the conversion of an existing one to a better and more profitable mode of operation.

The research furnace at Detroit-Michigan Stove Works has been in successful operation since June, 1935, and all requirements have been fully met.

The radiant tubes, replacing a full refractory muffle, are of the hairpin type so that all burner and eductor equipment is located at the rear of the furnace. To replace the former heat capacity, six radiant tubes are so arranged that approximately 60% of the total heat is supplied by four



Gas-fired radiant tube annealing furnace for brass and copper

bottom tubes and 40% by two sidewall tubes. These heat-resisting alloy tubes are rigidly fastened only at the burner and eductor ends and thus allowed to expand and contract with changes in temperature while floating on alloy supports. A new and unique feature in box-type enameling furnaces is the method of supporting the ware to be fired. The customary refractory piers are replaced by the tubes themselves which support the ware on the return legs. A complete description of this pioneer furnace was given by E. F. Gehrig of the Detroit-Michigan Stove Works and appeared last fall in the majority of ceramic journals, and in THE MONTHLY.

Summarizing the features of this installation, we conclude that:

1. The application of gas radiant tubes to firing porcelain or vitreous enamels is basically sound and, conservatively, results in an overall saving of 20% as compared with gas-fired muffle-type furnaces.
2. The quality of ware produced is pronounced equal or better than that obtainable with present practice in electric furnaces in regard to gloss, hardness and physical appearance.
3. The heat distribution is entirely satisfactory from the standpoint of operation.
4. The heating-up time is appreciably shorter than for muffle-type or electric furnaces.
5. The furnace atmosphere is equal to that obtainable in electric furnaces.
6. The overall efficiency, including the use of exhaust gases for drying purposes, compares favorably with that of electric furnaces.
7. The amortization of invested capital, based on 1¢ electricity and 50¢ gas should, at normal operating hours, not exceed 18 months for a new furnace and proportionately less for a conversion from electricity to gas-fired radiant tubes.

A nationally prominent manufacturer of enameled kitchen ware recently contracted for the conversion of a continuous hairpin-type electric enameling furnace to

gas-fired radiant tubes. This installation is now under construction and represents a new departure in firing continuous furnaces with gas fuel. The electric elements, controllable in three zones of the elevated heating chamber, are being replaced by equally controllable expanded radiant tubes which are located along the bottom, sidewalls and center pier of the existing furnace structure, insuring temperature gradients within the firing chamber which heretofore were not quite possible to obtain on maximum production due to the quantity of ribbon-type electric elements economically permissible per square foot of heating chamber wall area.

The radiant tubes obtain their maximum heat emission within the heating chamber proper, the spent gases are, however, within and from the same tubes, further utilized in the preheating chamber and subsequently for the drying of the incoming ware and finally, at very low temperature, discharged by means of a small exhaust fan into the atmosphere.

This application will, therefore, utilize almost all of the available heat in gas fuel for productive work. Enamel dryers which are usually an integral part of a continuous furnace are, for good reasons, mostly gas- or oil-fired or equipped with steam coils. As the efficient operation of these dryers depends on many factors, the indirect utilization or addition of the flue gases from the furnace to the existing equipment will naturally make steam coils unnecessary and lessen the operating expenses of other equipment.

The economic aspects of such a furnace or conversion are manifold. Furnaces will be easier to design and cheaper to build. The maintenance costs are low and at present costs of fuel and electricity, radiant tube furnaces are usually the lowest in operating cost.

Obviously, the application of radiant tubes in the ceramic field is not confined to vitreous enameling. In other classes of ceramic work, decorating of pottery and

glassware (on which the Committee on Industrial Gas Research is now working), glost firing of pottery and like processes where atmosphere control is essential for the production of a high grade article, internally fired radiant tubes will undoubtedly share in the progress of improving existing methods of firing. Protection of the ware by muffles or saggars will not be necessary. There seems to be no alternative for the pottery industry than to universally adopt the continuous type of kiln and to discard the periodic kilns. The trend is towards smaller, more flexible units with the utmost in control and simplification of ware conveying mechanism. Development of low temperature glazes and their adaptation to short-cycle firing will ultimately offset, in some measure at least, the advance in manufacturing costs attributable to various factors now influencing the competitive marketing situation. Engineering ability will be called upon to produce that firing equipment necessary to accomplish the requirements of the diversified processes. What part heat generated from radiant tubes will play in this development is still problematic. The fundamental requirements for static surface heating have been successfully demonstrated on porcelain enameling and the use of agitated, highly oxidizing atmospheres to procure the convection currents deemed essential for proper maturing of ceramic bodies and glazes does, in itself, not represent a serious problem inasmuch as the principles of heat transfer are concerned.

Radiant tubes as the heating medium should not be considered a cure-all for any existing unusual conditions or requirements but for those heating operations where theoretical requirements can be replaced by the application of sound combustion principles, the cooperative efforts of manufacturer and furnace builder will result in the development of heating equipment designed to produce the ultimate in economical heating operations.

Industrial Folders Promote Gas Air Conditioning

WITH a series of six four-page folders, The Bryant Heater Company in co-operation with a number of gas companies has opened a mailing campaign directed to those industries where exact and uniform control over the humidity with a gas-operated dehumidifier would mean substantial savings in manufacture and processing costs.

The aim of these folders is educational. The treatment is concentrated on the dollars and cents angle. The theme—exact humidity control in manufacturing processes—is emphasized, reiterated, and developed both from the negative and positive standpoints. The result is a practical, matter-of-fact presentation shaped unavoidably

to the reader's self interest, and in consequence arousing in him a desire to know more about this most up-to-date method of air conditioning, the development of which was a contribution of the gas industry and in which the gas industry cooperated through the American Gas Association.

Self interest is woven in such titles as "Uncontrolled Humidity Makes High Tides in Production Costs"; "Do Your Costs Hang on the Humidity Curve?"; "Uncontrolled Humidity Wastes Materials, Products, and Machine Time." Each cover design ties in with its title. Each design has been chosen for an effective eye-arresting treatment of the subject it illustrates.

On the inside spreads of the folders such titles as "What Is Your Drying Problem?"; "That New York Order Went Out a Week Late. Why?"; "Control Humidity and Lower Operating Costs"; lead quickly into the swing of the copy. Illustrations of humidity charts showing variations in relative humidity in such cities as Chicago, Boston, and Washington, with horizontal lines superimposed on the curve to show optimum relative humidities in various industries emphasize and graphically reiterate the major ideas of the copy.

The gas-operated dehumidifier is represented in each folder and a different successful installation is described in each.

A number of representative gas companies are cooperating in distributing this series of folders to executives of industries in their territories. It is generally becoming recognized in air conditioning circles that the direct gas dehumidifying method has many features for certain types of industrial problems that are not contained in other methods of air conditioning in the summer.

Gas Display Attracts Hotel Men

THE Industrial Gas Section, through its Display and Contact Committee, co-operated with The Peoples Gas Light and Coke Company in sponsoring a display of modern gas commercial cooking apparatus at the Mid-West Hotel Show, March 24-27. This was the thirty-fifth gathering of Mid-West hotel men and was representative of eight midwestern states.

The following manufacturers of apparatus displayed commercial gas cooking equipment: Albert Pick Company, American Stove Company, Blodgett Oven Company, Coleman Stove Company, Detroit-Michigan Stove Company, Middleby-Marshall Oven Company, Silex Company, and Standard Gas Equipment Corporation.

The gas appliances displayed by these firms presented a fine array of modern design and construction and embodied practically all the valuable improvements that have been advanced by the industry recently. In the opinion of the committee and other observers, the appliances were well received by those in attendance at the show.

On Wednesday, March 25, T. J. Gallagher, manager, commercial sales department, The Peoples Gas Light & Coke Company, delivered an address before the hotel people. His topic was "Saving Money with Modern Gas Equipment." Particular stress was laid by W. W. German on the new commercial gas appliances being manufactured and marketed today. The A. G. A. Approval Requirements for hotel ranges were touched upon and briefly described. Examples of large kitchen modernization with resulting higher satisfaction and money savings were explained.

Thomson to Easton

THE Metropolitan Edison Company of Reading, Pennsylvania announced the appointment of William L. Thomson as supervisor of house heating, commercial and industrial gas sales for its several properties in Pennsylvania and New Jersey, effective April 1. The company renders gas service in Easton, Nazareth, Pen Argyl, Hamburg, Marietta, and Elizabethtown, Pennsylvania.

Mr. Thomson will make his headquarters in Easton to which he comes from Philadelphia where he has been associated with The Philadelphia Gas Works Company since 1932.

Costs Less Too

Tests show that industrial gas and oxygen flames will cut through thick pieces of steel faster than oxygen-acetylene flames.

Beats the Old Brass Rail

A new method of heating White Castle Hamburger Shops with gas also heats the customer's feet as he stands or sits at the counter.

Worth Trying

Boston, Detroit and New York are among the cities where industrial gas window displays are regularly shown in co-operation with local manufacturers.

Sewing Up An Important Load

Immersion heaters using industrial gas have been installed in more than 300 stereotype pots since the Industrial Research Committee ran the original tests at the old New York World.

Quick Work

We like the spirit of the commercial cooking appliance company that received a delegation at the Hotel Show from the Industrial Gas Section, said delegation being greatly chagrined over the fact that it took a microscope to find the single lonely gas stove in the large array of equipment. The firm almost immediately hired an experienced gas designing engineer, and we predict that next year's show will be different.

Technical Section

F. A. Lydecker, Chairman

H. W. Hartman, Secretary

Martin I. Mix, Vice-Chairman

Production and Chemical Conference Offers Strong Program

HEADED by A. E. Lockwood, chairman of the Gas Production Committee, and Louis Shnidman, chairman of the Chemical Committee, the annual joint Production and Chemical Conference will be held at the Hotel New Yorker, New York, N. Y., May 25-27.

With five round-table luncheon conferences and a strong program arranged, this year's meeting promises to be of unusual interest to production and chemical engineers. E. J. Murphy of The Brooklyn Union Gas Company, Brooklyn, N. Y., and R. E. Kruger, of the Rochester Gas and Electric Corp., Rochester, N. Y., are co-chairmen of the Program Committee.

Following is the complete program:

MONDAY

May 25—10:00 A.M.*

Opening Remarks: Louis Shnidman, Chairman, Chemical Committee, Rochester, N. Y.

Greetings: Alexander Forward, Managing Director, American Gas Association.

Address: Herman Russell, President, Rochester Gas & Electric Corp., Rochester, N. Y.

Paper—Review of Principles of Heat Transfer: C. C. Furnas, Yale University, New Haven, Conn.

Paper—The Koppers Electrical Process for the Prevention of Nitrogenous Gum in Distributed Gas: W. L. Shively and E. V. Harlow, The Koppers Construction Co., Pittsburgh, Pa.

2:00 P.M.

Opening Remarks: A. E. Lockwood, Chairman, Gas Production Committee, New York, N. Y.

Paper—Shrinkage of Low-Temperature Coke on Reheating to a Higher Temperature: J. D. Davis and H. S. Auvil, Bureau of Mines Experiment Station, Pittsburgh, Pa.

Paper—Quantitative Analysis of Deposits in Manufactured Gas Distribution Systems: A. R. Bayer, The Brooklyn Union Gas Co., Brooklyn, N. Y.

Paper—Plant Experience in Practical Reduction of Gum Difficulties, Vapor or Liquid Phase: W. K. Beard, The Philadelphia Gas Works Co., Philadelphia, Pa.

Report—Subcommittee on New Developments: Wilbert J. Huff, Chairman, The Johns Hopkins University, Baltimore, Md.

TUESDAY

May 26—10:00 A.M.

Report—Subcommittee on Water Gas: F. B. Parke, Chairman, The Brooklyn Union Gas Co., Brooklyn, N. Y.

Address—The Relation of the Oil Industry to the Gas Industry: R. G. Griswold, Cities Service Co., New York, N. Y.

Report—Subcommittee on Analyses and Tests: J. F. Anthes, Chairman, The Brooklyn Union Gas Co., Brooklyn, N. Y.

Paper—Corrosive Action of Salt Water When Used for Cooling: E. M. Bliss, Public Service Electric & Gas Co., Harrison, N. J.

Report—Subcommittee on Carbonization and Coke: C. R. Locke, Chairman, Chicago By-Product Coke Co., Chicago, Ill.

ROUND TABLE LUNCHEON CONFERENCES

1:30 P.M.

1. Water Gas Operation.
2. Gas Conditioning and Purification.
3. Plant Maintenance.
4. Coal Carbonization and By-Products.
5. Economics of the Gas Industry.

A real "down to earth" discussion of subjects pertaining to the above divisions

will be had at these Luncheon Conferences. No stenographic record of the discussion will be kept, so be sure to be present.

WEDNESDAY

May 27—10:00 A.M.

Paper—A Study of the Removal of Free Sulphur from Spent Oxide: E. L. Sweeney and A. E. Sands, Boston Consolidated Gas Co., Everett, Mass.

Paper—Some Methods Used in Evaluating Heavy Oils for Gas Making:

(a) Relation of Oil Gravity to Overall Efficiency When Using Heavy Oils.

(b) Method of Determining the Gas and Tar Making Characteristics of Heavy Oils.

H. G. Terzian, United Engineers & Constructors, Inc., Philadelphia, Pa.

Paper—The Two-Stage Thylox Process for Complete Removal of Hydrogen Sulphide from Gas: A. R. Powell, The Koppers Construction Co., Pittsburgh, Pa.

2:00 P.M.

Paper—The Effect of Breeze Admixture to Coal on Coke Strength: F. J. Pfluke, Rochester Gas & Electric Corp., Rochester, N. Y.

Paper—The Safety Practice of Coke Plants: Chas. Koons, Koppers Gas & Coke Co., Kearny, N. J.

Paper—The Quantification of Dust in Gas Transmission Systems: I. H. Levin, Blaw-Knox Co., Pittsburgh, Pa.

Nearly 300 Attend Distribution Conference at Memphis

WITH nearly 300 delegates in attendance, the thirteenth annual Distribution Conference, held at Memphis, Tenn., April 6-8, was characterized by vigorous informal discussions and the presentation of many comprehensive papers on current distribution problems.

A well-diversified program, under the leadership of Erick Larson, acting chairman of the Distribution Committee, was supplemented by lively accounts of the problems faced by distribution men during the record floods in various sections of the country.

A warm tribute was paid to George Boyd, chairman of the conference who was

unable to be present due to illness and whose splendid planning in the beginning had done so much to insure the success of the conference.

Alexander Forward, managing director of the American Gas Association, in his remarks to the conference, paid special tribute to the men who, under appalling flood conditions, maintained gas service in most cases without interruption or impairment of service. A large collection of photographs of flooded gas plants and distribution systems was made available for inspection at the meeting through the cooperation of *Gas Age-Record*.

In his address of welcome to the visiting

* The times noted in this program refer to Daylight Saving Time.



Luncheon conference at which Pipe was the principal discussion topic; one of five held during the Distribution Conference

delegates, W. A. Dunkley, Memphis Power and Light Company, briefly described the history of the local company which was organized in 1853. Since natural gas was introduced to Memphis seven years ago, Mr. Dunkley stated, gas sales have multiplied by four while distribution facilities have been increased by 45 per cent.

L. B. Denning, president of the Association, made an inspirational talk in which he stressed the importance of giving thought to the human factor in problems as well as the engineering—the necessity of making friends of our customers and being alive to constant changes.

Luncheon Conferences

The afternoon of the first day of the conference was entirely devoted to five Round Table Luncheon Conferences, each of which met with enthusiastic approval. J. D. von Maur, Consumers Gas Co., Toronto, presided at the conference on Meters; M. I. Mix, The Peoples Gas Light and Coke Co., Chicago, presided at the Appliance Servicing luncheon; H. L. Gaidry, New Orleans Public Service Inc., presided at the Pipe conference; H. E. Bates, The Peoples Gas Light and Coke Co., Chicago, presided at the conference on Regulators and Regulation of Pressure; and E. H. Eachner, Boston Consolidated Gas Co., Boston, Mass., presided at the conference covering Portable Equipment.

One of the outstanding addresses of the meeting was presented by Merrill N. Davis, vice-president, S. R. Dresser Manufacturing Company, Bradford, Pa., who spoke on "The Manufacturer, the Utility, the Gas Customer." Mr. Davis was also chairman of the Entertainment Committee, and awarded prizes to the winners of the informal golf tournament held Tuesday afternoon.

The business program included papers on the following subjects: "Importance of Controlling Design and Fabrication of Welded Joints for Gathering Lines, Manifolds and Drips"; "Corrosion Mitigation on the West Coast"; "Pipe Coatings and Corrosion"; "Pipe Joints and Pipe Materials"; "Equipment and Methods Used in Leak Detection"; "Meters and Meter-

ing"; "Experience in Leak Proofing Bell and Spigot Joints"; and "Educational Method—Street and Service Department Employees." Space does not permit summaries of these papers in this issue of THE MONTHLY.

The conference was completed by an Open Forum, devoted largely to reports of the men in charge of the Round Table Luncheon Conferences. The high points of each luncheon group meeting were summarized and discussed.

Meter Diaphragm Deterioration

By D. E. WERBA

Georgia Natural Gas Corp., Atlanta, Ga.

ONE of the fascinations of the gas industry is the frequency of new discoveries. A mold discovered on meter and governor diaphragms adds to the unusual of today, but its description may contribute to the solution of similar difficult problems in the future. The existence of the mold has already been recognized on leather in two types of gas.

The gas purchased and as received at the gas plant of the local gas company in Brunswick, Georgia, is by-product gas from the cracking stills of the Atlantic Refining Company. The B.t.u. content of this oil refinery gas has varied anywhere between 1,100 and 1,800 B.t.u. after being pumped approximately two miles at forty pounds' pressure from the stills to the gas plant. Naturally, the analysis of this gas varies according to the B.t.u. content. A typical analysis would probably be as follows:

Illuminants including methane	93.6%
CO ₂	1.0%
O ₂	0.5%
CO	0.5%
H ₂	4.4%
	100%

The above variable gas is diluted with air as it is received at the gas plant so the heat content of the mixture is 575 B.t.u. This mixing takes place at low pressure and on all the gas received before distribution. In fact the air-diluted

still gas is pumped and stored in low-pressure holders before distribution. Previous to storage the gas is washed and purified in dry oxide boxes.

We have no recent complete analysis of the mixed gas. The oxygen content of the mixed gas on a partial analysis showed a percentage of about 13.5. The nitrogen content was about 50.5%. That left a balance of 36% for the illuminants, hydrogen and other inerts. It is estimated that those other inerts run about 1/2% and the hydrogen runs about 1.5%.

The low-pressure system is fed in two ways. The greater portion is fed directly from the plant holder at low pressure. A small portion is fed through district regulators into the low-pressure mains from the high pressure, which high pressure is fed from the mixed gas in the low-pressure holder.

To describe the exact appearance of a mold formation is difficult. Sometimes to the naked eye a mold seems to be composed of white stringy fibres. Other times it appears to resemble whitewash. (We have all probably stored wet boots or shoes in a closet and later observed that they were coated with a white appearing substance. We called it "mildew.") Bacteriologists have called the mold forming bacteria "spor forming" and have stated that they appear to be the type that exist with or without the presence of air.

For years we have had trouble with meter diaphragms drying up and becom-

ing covered with a white moldy coating. Meter diaphragms showed evidences of mold in less than a year's time. The bulk of the meters initially tested fast due to the drying effect of the mold. It did not take long for the meters to become D. R. once the mold spread through the diaphragm.

The meter problem for years has been the subject of much study and research. Several theories were offered in explanation of the unusual failure of our diaphragms—such as absorption of the meter dressing through entrained gasoline vapors and oxidation through the high percentages of air in the gas—but each theory proved futile.

We finally struck upon a unique theory, and we now believe we have the explanation and solution of our troubles. We decided that the mold forming materials or organisms were the cause of our troubles rather than considering that the mold formation was an incidental condition. We had not previously considered the mold as being a bacterial formation. We further had a bacteriologist examine some of the diaphragms, and he identified the mold forming bacteria for us.

We then came to this conclusion. Since our gas has peculiar characteristics and contains over fifty per cent of air, in the introduction of that air, we were injecting the mold forming bacteria. As we were given to understand, this bacteria thrives in darkness and the diaphragm dressing forms good food for it. As the bacteria multiply, they soon devour the dressing, and consequently therein originates the cause of our diaphragm troubles.

Further investigation disclosed that in butane-air gas plants, no similar troubles have been experienced, and we further found out that in our intermediate pressure system no mold existed—it was found only in the low-pressure part of our system. This led us to the conclusion that either compression or the dryness of the butane-air gas or the high-pressure gas caused the mold to be dormant, or killed it.

Natural Gas Diaphragms

We have found mold present on a few natural gas diaphragms. The natural gas distributed is *not* mixed with air. This subject of causes of mold on natural gas diaphragms, although related to the Brunswick situation, is one which requires separate research. In properties where natural gas is humidified or conditioned, there are combinations of circumstances which may produce molds. This also would involve obtaining mold data on "locked off" meters and also on meters which have been taken from service, tested, and stored in the racks before they are again placed in service.

We have found mold present on some of the regulator diaphragms in natural gas towns. This mold in most instances appeared to originate on the atmospheric

side of the diaphragm. We have made no special study of this question of mold on regulation diaphragms, but we are specifying that our regulator diaphragms be treated with disinfectant. Our opinion is that mold will grow and destroy regulator diaphragms under variable conditions and combinations. We do know that dampness and darkness accelerate mold growth. In all this question of mold growth on either meter or regulator diaphragms, we have taken the position that it is impractical to change methods of gas manufacture, conditioning, or mixing as an answer to mold prevention. The mold bacteria are in the air and thrive under certain conditions. *Treat the leather with a dressing so that the bacteria cannot thrive or exist on it, is, in our opinion, the solution.*

Elimination of Bacteria

Since we felt that we had finally solved the origin of our troubles, our next problem was to find ways and means for the elimination or extermination of the mold forming bacteria. We corresponded with Mr. van der Pyl, of the Pittsburgh Meter Company, and described our theory and trouble to him. He suggested that they treat diaphragms in his factory with beta naphthal and cresol (one part to 1000 parts of oil) while they are in storage to prevent the formation of mold. Since that method of disinfecting diaphragms was an old tanners' remedy for mold troubles, we decided to use beta naphthal and cresol (two parts to 1000 parts of oil) in our meter dressing. We, consequently, decided to bring in all the meters and treat or spray the diaphragms with meter oil treated as described above. This dressing did kill the mold. All new diaphragms are likewise treated with the disinfectant.

Naturally, we have to readjust most of the meters as they are found to be fast when brought in. We allow the meter to set on each side eight hours, finding that eight hours are necessary for complete penetration of the disinfecting oil on both sides of the leather. We spray the oil between diaphragms and have a measured amount which we use. The majority of our meters are iron case meters.

The above briefly described our problem and present remedy. We hope we have the correct remedy. We do not know how permanent our disinfectant in the oil dressing will be. So far, it has proven effective. We intend to experiment further with other disinfectants such as copper resinate, and then make observations. We hope that through the use of the disinfectants we will at least be able to secure the normal life for our diaphragms instead of only a year's service. We have found some mold under certain conditions. The atmospheric side of our regulator diaphragms also presents a good front for the attacks of mold forming bacteria. We are starting to disinfect all new regulator diaphragms for that reason.

We started treating our diaphragms in the spring of the year 1935. We have perhaps examined about 25 of the 600 meters which had been treated early last spring and all indications are that our method of treatment is successful and will continue to be. We have noted no harmful effects to the meter which we can attribute to the use of disinfectants.

Our method of treating diaphragms is simple. As previously stated, we use iron case meters at this property. We remove the adjustment plug located in the side of the meter. Through that plug hole we insert approximately 15 oz. of the diaphragm oil which contains the disinfectant. This places 15 oz. of oil between the diaphragms. We permit the meter to be on one side for eight hours and then turn the meter over, permitting the oil to penetrate on the opposite side for eight hours. We have found *eight hours'* treatment for diaphragms with the 15 oz. of oil to be sufficient for complete disinfecting of the leather and meter.

Long Career of Gas Engineer Ends



C. L. Krause

CHARLES L. KRAUSE, gas engineer, whose 52 years' service with the Union Gas and Electric Company, Cincinnati, Ohio, won him public acclaim for faithful duty, died April 14. He would have been 74 years old on May 16.

Mr. Krause started with the gas company at the age of 21 years, as a pipe fitter, at \$12 a week. His first duty with the firm, then the Cincinnati Gas Light and Coke Company, was to repair damage done by the raging waters of the record Ohio River flood of 1884. He was made a gas engineer in 1905 when he was moved to the central office of the company.

During his time as gas engineer for the Union Gas and Electric Company, Mr. Krause designed many types of industrial gas burners which were later adopted and patented by various manufacturers. In the early days of industrial gas equipment his services were requested by a number of gas companies in various parts of the United States, and he could rightfully be called a pioneer in the application of gas for industrial purposes. From 1906 to 1920 he was personally responsible for the design, sale and use of all industrial gas equipment in greater Cincinnati.

A testimonial dinner was given in his honor at the Cincinnati Club March 1, 1934, in recognition of his 50 years' service with the company up to that time. He was a member of the American Gas Association.

Testing Laboratory

R. M. Conner, Director

Managing Committee: J. S. DeHart, Jr., Chairman

N. T. Sellman, Secretary

Improved Design Marks Recent Water Heater Development

IT is apparent from recent testing activities at the American Gas Association Testing Laboratories in Cleveland and Los Angeles that gas water heater manufacturers are, in general, tending towards radically re-designing their lines of products to achieve higher levels of usefulness and modernity in construction. In this respect the gas water heating industry of America seems to be following the cue of the gas range industry, which, in the past two years, has so amazingly improved and modernized domestic gas cooking appliances that present-day models bear but slight resemblances to the traditional kitchen range.

The most noticeable difference between the 1936 model water heaters and their predecessors is in the point of external design and appearance. Many companies are now merchandising beautiful instantaneous and storage water heating units which stand out as fine examples of modern decorative home furnishings. The aim seems to be to produce appliances which may be used either on living-floor levels where they are frequently seen or in basements converted from unfinished, dark workrooms into attractive recreation rooms, tap rooms, or studies.

Dressing Them Up

Cabinet type storage water heaters, several in rectangular rather than the conventional round motifs, are cropping up with increasing frequency in new appliance lines. Piping and controls are being concealed in casings, or removed to rear faces not visible from the room. Legs are becoming shorter, and often skirts carry the vertical faces of heater exteriors all the way down to the floor without breaks. Modern lines, angles, and proportions are being used. In nearly every case the basic principles of artistic design are now being observed, in addition to the principles of fine engineering. Up-to-date home owners demand not only serviceable but appealing domestic equipment.

Among the new water heating units now being submitted to the Laboratories for approval testing are an increasing number of small instantaneous units very similar to the water heaters used widely in England. These are designed for very small demands and usually for single purpose applications. Several of them are of wall types, and most of them are strikingly modern. The recognized engineering difficulties with such units, arising from excessive condensation on long water coils,

By HARRY W. SMITH, JR.

Publications Dept., A. G. A. Testing Laboratories

are being met by using smaller coils and more fins or other heat absorbing surfaces to compensate for the loss in length of tubing. Recent improvements in automatic control and safety accessories, as applied to domestic water heating equipment, have also helped to stimulate the current greater interest in small instantaneous units. In certain cases ultra-modern wall-type instantaneous heaters are being developed in sizes suitable for large central system deliveries.

Low-Demand Trend

In general, however, the trend, first noted two years ago, toward producing low-demand heaters seems to be persisting. Further, special conversion units of revolutionary design, sold to be adapted to unmoded manually operated storage systems and to convert them to either full automatic or low consumption usage, are regularly appearing. In one case heat is supplied solely by radiation to storage tank side-walls. In another, the side-arm circulating unit offered is extremely compact and unconventional in design, although nearly every type of control or accessory is included in the tiny self-contained unit.

There seems also to be a tendency toward the manufacture of multiple-rate water heaters, based upon the theory that one model of heater as purchased from the manufacturer may be adjusted by the dealer or gas company to suit different customer output demands.

Apparently, the water heater is truly entering a phase of amazing development. The first indications of combining water heating equipment with other home furnishings are noted in the very recent presentment of an enameled table top unit for installation in the kitchen. Many similar innovations in water heater construction may be expected to appear in coming months. Water heater manufacturers, encouraged by mounting sales, are preparing themselves for new and up-to-the-minute markets.

Nor is all the energy toward building better water heating equipment expended in producing appliances of new types and smarter architecture. Many improvements are being made in water heaters of the conventional design. All types are being engineered more intelligently and constructed more ruggedly. In fact, the latest

edition of the American Standard Approval Requirements for Gas Water Heaters, which became effective January 1, 1936, includes numerous additional constructions and performance requirements which must be met by appliances now submitted for approval. In addition, many of the previous requirements have been revised to make them more rigid. For example, water heaters are now required to have a thermal efficiency of 70 instead of 65 per cent. Further, by a recent ruling, all storage water heaters, irrespective of the date of approval, must be equipped with means to prevent both excessive tank water pressures and temperatures. The American Standard requirements, on the basis of which Testing Laboratories' certification is granted, are thus continually being revised to keep pace with the modern trends noted herein.

From the large number of water heating appliances recently submitted to the Association's Testing Laboratories for approval it certainly seems that American water heater manufacturers are doing their part in offering to the public fine modern gas equipment. The availability of such equipment should result in greater success of the national water heater sales campaign launched early in February under the sponsorship of the Commercial Section of the American Gas Association.

Couzens Rejoins Laboratories' Staff

RESIGNING his position as eastern manager for Grayson Heat Controls, Limited, manufacturers of thermostatic and clock control equipment for gas appliances, W. M. Couzens rejoined the staff of the American Gas Association Testing Laboratories in Cleveland on March 1, in the capacity of assistant chief engineer. Prior to December, 1933, Mr. Couzens had served with the Laboratories for a period of over 7 years during which time he was engaged in various capacities including those as supervisor of the Pacific Coast Branch Laboratories and as head of the research department of the Cleveland organization.

Starting as a testing engineer in 1926 at the Cleveland Laboratory, after graduating from Tri-State College, Angola, Indiana, Mr. Couzens was soon assigned to research work, principally in the field of gas mixing, and in 1928 was appointed chief inspector. In 1930 he was chosen to organize the first branch Laboratory in Los Angeles. Based

upon the fruits of his organizing efforts, the Pacific Coast branch of the American Gas Association Laboratories has since flourished to a position of great importance to the American gas industry. In February, 1933, Mr. Couzens exchanged posts with Dr. F. E. Vandaveer, supervisor, and re-

turned to the Cleveland institution to manage research activities. His service with the Grayson organization began in December, 1933.

As assistant chief engineer, Mr. Couzens will work with K. R. Knapp in managing testing activities in Cleveland.

Probe Reducing Furnace Atmospheres in Study of High-Temperature Gas Combustion

By E. O. MATTOCKS
A. G. A. Testing Laboratories

CARRYING forward its program of research in the fundamental principles of high-temperature industrial gas combustion, the Committee on Industrial Gas Research of the American Gas Association has authorized extensive investigational work at the Association's Testing Laboratories in Cleveland. The present studies are confined to "Determination of the Effects of Reducing Atmospheres on the Combustion of Industrial Gas." Already the work is in progress.

This newly undertaken project will extend the findings of previous researches into parallel fields. It supplements investigations of: (1) characteristics of burning gas with preheated air; (2) elimination of noise from industrial gas applications; (3) fundamentals of combustion space requirements in high-temperature gas furnaces; and (4) effects of operating temperatures and pressures on the combustion of industrial gas. The results of these four were reported in American Gas Association Laboratory bulletins Nos. 685, 692, 723, 724, 746 and 748.

It is expected that the significant new combustion knowledge developed during the study listed above as (4) and which offers basic data on industrial gas utilization with oxidizing atmospheres in open-fired furnaces, may be duplicated for reducing furnace atmosphere conditions. The problem, however, is considerably more complex.

For example, previous studies involved routine micro-analyses of combustion products for minute traces of carbon monoxide, a problem facilitated by the existence and routine use of the Iodine Pentoxide Apparatus. The new studies, however, will entail corresponding micro-analyses of combustion products for the smallest traces of oxygen, hydrogen, methane, and ethane. These are matters far removed from established scientific laboratory precedent. Repeated determinations of oxygen concentrations of less than 0.05 per cent must be accurately made. Eminent chemists and gas analysis experts, such as Dr. Martin Shepherd of the National Bureau of Standards and Prof. C. F. Prutton of Case School of Applied Science, are assisting the A. G. A.

Laboratories in developing means for such precise oxygen, hydrogen, ethane and methane analysis. A solution is anticipated soon.

Among the most salient findings of the completed work on high-temperature gas combustion was the discovery and accurate determination of a common relationship between the excess oxygen in flue gases required for complete combustion and flue gas temperature—a relationship independent of all variables except degree of preheat and degree of premixing of gas and air. In the course of the new work, it will be attempted to ascertain a similar curve relating the reducing products in flue gases required for complete combustion and flue gas temperature. Data of such a nature possess unquestionable broad value in industry and materially extends the sum total of scientific knowledge in the field of industrial heating.

As in the earlier work, the ingenious Spectral-Line Reversal Method will be employed for high flue gas temperature measurements. This method of temperature analysis, pioneered at the time the first fundamental high-temperature gas combustion researches were being conducted at the American Gas Association Laboratories, is now becoming common in industrial heating studies. It is expected that upon completion the reducing atmosphere studies will be published in bulletin form.

Portland Company Recruits Leighton

JAMES A. LEIGHTON, American Gas Association Laboratories' engineer since June, 1930, will take up general duties with the Portland Stove Foundry Company, Portland, Maine, on May 1.

During his six years with the Cleveland Testing Laboratory, Mr. Leighton has served as testing engineer, inspector, research engineer, and in the publications department as acting secretary for the various requirements committees. Recently he has been acting as assistant to F. O. Suffron, head of the research department of the Laboratories.

Mr. Leighton is a graduate of Massachusetts Institute of Technology and holds his degree in the field of engineering administration.

Mixed Gas Research Reports Available

COPIES of American Gas Association Laboratories' Reports Nos. 597, 645 and 689, reporting on the mixed gas research investigation conducted by the Association may be obtained at Association Headquarters or at the Testing Laboratories in Cleveland.

The nominal price, to cover reproduction mailing and postage is \$2.00 for the set of three to members and \$4.00 to non-members. Some copies are available of the final report No. 689 in leather binding, at \$1.00 extra.

Article on CO Poisoning

THE Journal of the American Medical Association, February 29 issue, carries an article "The Problem of Nervous and Mental Sequelae in Carbon Monoxide Poisoning" by Drs. Frederick H. Shillito, Cecil K. Drinker and Thomas J. Shaughnessy. This article comprises a further discussion of this subject, which was presented at the 1935 Convention of the American Gas Association by Dr. Drinker.

Reprints of the article in the Journal of the American Medical Association are available from the Secretary of the Accident Prevention Committee, Association Headquarters.

Conversion Burner Has Wide Application



NOTHING in the fire box but the fire" is a short description of the Lo-Blast gas conversion burner, shown above, made by the National Machine Works, Peoples Gas Building (Sales Office), Chicago, Ill. It was designed primarily to provide a conversion burner suitable for application to downdraft or reversible flue types of boilers or furnaces. Its quiet operation makes possible the use of a power burner with a warm air furnace. Remarkable efficiencies are claimed by the manufacturers and the original two sizes 200,000 and 360,000 B.t.u. input have been augmented by burners from 100,000 up to 4,500,000 B.t.u. per hour capacity.

A folder by National Machine Works is available, showing the burner in operation and also offered is a specification sheet.

A. G. A. Laboratories' Seal Displayed at San Diego Exposition



SEVERAL hundred thousand visitors to the Second Pacific International Exposition at San Diego, California, will, during 1936, be told a story of "Protection" and "Satisfaction" in the use of gas appliances, through the medium of the American Gas Association Testing Laboratories' exhibit illustrated above. Through the generous cooperation of the San Diego Consolidated Gas and Electric Company and the Southern Counties Gas Company, which utilities contributed the space, as well as the Los Angeles Gas and Electric Company,

which assisted in the design and erection of the display, this fine piece of institutional advertising is made possible.

From striking black panels trimmed in gleaming chromium, raised wooden letters speak a simple and a direct message. Thoroughly modern in appeal and terse in presentation, the exhibit should "attract" and "sell." In all, it offers but 20 words, one blow-up illustration, and an enlargement of the Laboratory Seal of Approval—but it tells the story.

Gas Use Gains in London

GAS sales of the Gas Light and Coke Company, London, England, rose 515 million cubic feet in 1935 over 1934, according to the annual report of Sir David Milne-Watson, governor of the company. New gas appliances were installed at the rate of more than one a minute throughout the entire year—including 364,289 gas cookers, 151,137 radiant fires, and 66,078 water heaters.

While gas refrigeration is in its infancy in England, Sir David reported that his company sold more than 9,000 gas refrigerators in its first campaign to make them popular.

Other interesting facts brought out in the company's report: Modern gas lamps have been put up along 30 miles of main road in and around London in the last

four years. Sixteen new contracts for gas street lighting were obtained in 1935. Over 19,000 factories in the London area now use gas for industrial processes.

Fuel Estimator

HOUSE HEATING engineers and others who have frequent occasion to estimate the requirements of whatever fuel is used for any building on which the heat loss or the installed radiation is known are faced with the problem of working out a rather complicated set of calculations. Almost equally difficult is the work of comparing various fuels at different operating efficiencies.

The B. A. Fuel Estimator, manufactured by the Calculator Specialties Co., 122 South Michigan Avenue, Chicago, now makes this work simple. The Fuel Estimator is in

the form of a celluloid slide rule with scales for oil, gas and coal consumption, and with a slide carrying the degree days and the B.t.u. value of the respective fuels. An index slide permits adjustment of design temperature differences and thermal efficiencies. Readings can be based on thousands of B.t.u. heat loss per hour, or the square feet of hot water or steam radiation, as the case may be. The rule is 7 inches long and 2¼ inches wide, made entirely of celluloid.

The back of the slide, as well as the back of the entire estimator, carry information on various fuels, efficiencies, degree days, and an explanation of how the device works. Once the method of operation has been mastered, it makes it possible to determine the known quantities with great ease, accuracy and speed. The retail selling price of this device is \$1.00.

—C. G. S.

Gas House Heating Gains in New Jersey

USE of gas for house heating has been gaining rapidly in the first three months of this year, a recent survey by Public Service Electric and Gas Company, Newark, N. J., shows. In the period from January to March, inclusive, 220 customers contracted for gas house heating compared to 32 in the corresponding period of 1935. Also the number of house owners installing summer cooling air-conditioning equipment was nearly twice as large as last year during this same period.

A significant feature of present home construction activities is that a very large percentage of the dwellings being erected, even in the relatively low cost class of homes, are being insulated and equipped with gas heating systems.

Meter Reading Records

ALTHOUGH each man averaged close to 4,000 readings a month, 16 meter readers of the Brooklyn Union Gas Co., Brooklyn, N. Y. went through the whole of last year without an error being recorded against them. One man read a total of 77,569 meters and another read 74,768, which gave them averages of over 6,000 readings a month.

The number of meter readers who went through the year without an error was the largest on record. The previous year 14 maintained perfect records, but prior to that the largest number was ten.

For one of the men 1935 was the sixth successive year to pass without his having an error recorded against him. He is Charles V. Dillon, of Metropolitan Branch, who took 59,780 readings last year. In the past six years he has read a total of 415,718 meters, which represents an average of 5,774 a month.

Rulings Preclude Evasions of Requirements on Relief Valves

TWO significant rulings, as far as manufacturers of water heating equipment are concerned, have recently been made by the Subcommittee on Approval Requirements for Gas Water Heaters on pressure and temperature relief valves or automatic gas shut-off devices supplied with storage water heaters.

By the most recent set of American Standard Approval Requirements covering gas water heaters and by long-deliberated special action of the A. S. A. Sectional Committee, Project Z21, A.G.A. Approval Requirements Committee, every approved storage water heating unit manufactured after January 1, 1936, is required, regardless of the date of approval of the model, to carry "as an integral part, means to prevent both excessive water pressures and temperatures." Manufacturers of water heating equipment were apprised of this regulation well in advance of its effective date, and, at the present time are almost unanimously complying with it. However, the possibility that certain unfair situations might develop has necessitated action by the Water Heater Committee and the Laboratories as follows:

1. Relief valves or shut-off devices shipped with approved storage water heaters must be actually used on the heaters, although manufacturers may, in order to avoid special crating and shipping procedure, ship the protective devices detached from the tank, these accessories must be enclosed in the same crate as the heater proper, be accompanied by any fittings necessary for their attachment, carry instructions for their connection, and be actually sold with the heater. It is not permissible for producers of heaters to sell approved units to dealers, jobbers, or consumers along with the required relief or shut-off devices, and then at a later date, repurchase the safety accessories or accept them in return for credit on the customer's account. It is mandatory that heater manufacturers actually intend that relief devices be used and properly installed, and that they enforce such usage and installation.

2. Approved storage type water heaters manufactured after January 1, 1936, or the manufacture of which was completed after that date must be equipped with means to automatically prevent excessive water temperatures and pressures. Those heaters which were completely manufactured before January 1, 1936 and are not yet sold, however, will not be required to carry such equipment whether such heaters are found in manufacturers' store-rooms or on dealers' sales floors.

The first ruling precludes any evasions of the relief valve clauses of the new American Standard Approval Requirements for Gas Water Heaters which would permit manufacturers to sell, in effect, "approved" heat-

ers without proper protective accessories. Such evasions would not only be unfair to manufacturers complying in detail with the requirements but to purchasers or ultimate users of such appliances as well.

The second ruling clarifies the Laboratories' position in regard to the date of effectiveness of the original relief valve requirement for storage water heaters and is self-explanatory.

ACCOUNTING FOR THE UNACCOUNTED-FOR

(Continued from page 183)

ule (which must be available) the first meter reading day was on the first day of November, so that 2.4 per cent, or 1/42nd part of the gas sent out on that day, representing half the consumption of the meters read that day, will have to be included in the December sendout for comparison with December sales. On the second and third days of November no meters are read, so 4.8 per cent of the gas sent out on those two days will appear in the December sendout-sales comparison. On the fourth, 7.1 per cent of the gas sent out will appear in the December comparison and so on until the last day when all the gas sent out on that day appears on the December comparison. The tabulation of these calculations is included.

The gas sent out in December which actually is read in the consumers' meters in that month must be determined. From the daily sendouts the proportion is deducted which will be read in January meter readings. Thus, on the first day of December no meters were read, so that no deduction is made. On the second day, 1/21st part of the meters are read, so that 1/42nd part or 2.4 per cent of the sendout on that day will appear in the January meter readings. On the next day, 3/42nds, or 7.1 per cent appears in the January readings and must be deducted.

The specimen calculation follows:

December, 1935	
Sendout of Prior Month (Nov.) read in Consumers' Meters in Current Month (Dec.)	1029.1 MM
Actual Sendout of Month (Dec.)	2413.6 MM
	3442.7 MM
Sendout of Current Month (Dec.) which will be read in Consumers' Meters in following month (Jan.)	1276.8 MM
Equivalent Sendout to Sales (Dec.)	2165.9 MM
Sales and Company Use	1908.8 MM
Unaccounted for	257.1 MM
Per cent Unaccounted for	11.9 %
Mean Temperature—Current Month (Dec.)	30.6° F.
Mean Temperature—Previous Month (Nov.)	48.6° F.
Average Temperature	39.6° F.

Day of Month	November 1935			December 1935		
	Daily Sendout MM	Factor from Meter Schedule	December Portion of Nov. S.O. MM	Daily Sendout MM	Factor from Meter Schedule	January Portion of Dec. S.O. MM
1	65.4	.024	1.6	73.7	—	—
2	61.5	.048	3.0	75.5	.024	1.8
3	71.0	.048	3.4	76.6	.071	5.4
4	65.5	.071	4.7	86.4	.119	10.3
5	63.0	.095	6.0	78.3	.167	13.1
6	72.0	.119	8.6	80.6	.214	17.3
7	68.8	.167	11.5	71.5	.238	17.0
8	67.6	.214	14.5	74.5	.238	17.7
9	65.6	.262	17.2	68.5	.262	17.9
10	67.7	.286	19.3	71.1	.309	22.0
11	64.8	.286	18.5	71.8	.357	25.6
12	63.8	.309	19.7	72.6	.405	29.4
13	68.3	.357	24.4	72.5	.452	32.8
14	69.7	.405	28.3	65.3	.476	31.1
15	70.7	.452	32.0	72.6	.476	34.5
16	66.0	.500	33.0	72.7	.500	36.4
17	77.5	.524	40.7	75.6	.548	41.5
18	74.3	.548	40.7	75.5	.595	44.9
19	71.1	.595	42.4	71.0	.643	45.7
20	67.3	.643	43.3	77.3	.691	53.4
21	68.2	.691	47.1	80.6	.714	57.6
22	69.9	.738	51.6	82.4	.714	58.9
23	71.6	.786	56.3	83.0	.738	62.0
24	79.1	.810	64.1	86.6	.786	68.1
25	74.2	.833	61.9	91.7	.810	74.2
26	71.9	.881	63.4	78.7	.833	65.6
27	73.8	.929	68.6	83.4	.881	73.5
28	77.0	.952	73.3	79.8	.905	72.2
29	66.1	.976	64.5	91.7	.905	83.0
30	65.5	1.000	65.5	85.7	.929	79.6
31				86.4	.976	84.3
	2,078.9		1,029.1	2,413.6		1,276.8

Personnel Service

SERVICES OFFERED

Sales Supervisor or Sales Engineer. Have had considerable experience in industrial, commercial, house heating and domestic sales work. Also am familiar with design and installation of equipment. Have worked with manufactured and natural gases. 1004.

Gas Engineer (29) desires new connection; graduate M. E., 8 years' experience in manufactured gas; production, transmission, distribution and construction; operation, maintenance, design, planning, testing, reports, studies, budgets, law cases; butane plant construction and operation; licensed stationary engineer and licensed Professional Engineer (N. Y.); completed Rutgers and Columbia extension gas courses. 1007.

Engineer with utility accounting experience. B.S., M. E. E.; postgraduate work. Three years' research assistant, National Industrial Conference Board. Twelve years' gas and electric utility experience, rates, franchises, cost allocations, contracts, research in utility management problems. Experience with P. S. C. accounting. (N. Y.). 1008.

Graduate Engineer with twelve years' experience in the gas business; assistant superintendent of large water gas plant, estimating costs for construction and alteration of coke and gas plants, physical inventories and appraisals, desires position in operating or construction department, married, (35). 1011.

Semi-Senior Accountant for three years—public utility staff—accounting firm, then three years as special accountant with large electric and gas corporation until they went into receivership. Auditor of disbursements for large corporation board, thorough experience in all departments. (30). 1014.

Utility Executive available: have had 25 years' experience in all branches of utility business, organization, financing, construction, operation and utilization. Recently vice-president in charge of sales of large holding company, selling gas, electricity, water, ice, fuel, merchandise and securities through local operating companies. 1016.

Engineer, Graduate M. E. 20 years' experience in electric utility, manufactured and natural gas, appraisal valuations, previously manager, general superintendent and engineer for operating company, temporarily employed. 1018.

Insurance Specialist: graduate engineer, experienced utilities, operating and holding company, meter reader to junior executive; now employed, specialized last five years in producing large economies in insurance protection of all kinds for utility companies. Available special reports or full time. 1019.

Fifteen years, practically all spent in the design, construction, and appraisal of manufactured gas plants and distribution systems have suitably fitted an engineering graduate for twenty or more additional years of conscientious, competent service to the employer who can offer a future. Available now. 1020.

Geologist, valuation engineer—University education; many years' experience with largest producer in Appalachian fields, know producing sands, depths, rock pressures, depletion. Also valuation expert on mechanical equipment inventory for gas plants. Statistician and chart experience. (38). 1021.

Gas Engineer, now employed, desires position as manager, industrial gas engineer, or distribution engineer. Ten years' experience in all branches of the manufactured gas business, including three years as industrial gas sales engineer; some experience with natural gas. Graduate (M. E.). (31). 1022.

Utilization—testing—sales—installation—of gas appliances. Long experience in house heating, water heating, hotel and restaurant, industrial work; in metropolitan New York and vicinity. Utility or manufacturer. 1023.

Engineer-Accountant graduate engineer, sixteen years' experience preparing, presenting valuations and original cost analyses of tangible and intangible property (electric, manufactured and natural gas) for reorganization, sale, recapitalization, insurance, franchise, rates and commissioner's review. Prepared rate studies and presented rate schedules. Set up fixed capital records. 1024.

SERVICES OFFERED

Gas Analyst—Seven years' experience in research and gas industry. Thoroughly qualified in every phase and mode of gas analysis, including Fodbielski fractionation. Now in charge of gas laboratory. 1025.

Auditor—Office Manager. Former office manager of 50,000 account gas company desires opening anywhere. Experience covers fifteen years on all utility clerical and accounting functions. At present temporarily employed utility auditing by well-known public accounting firm. (32) Married. 1027.

Sales Supervisor. Specialist in introduction complete line of gas appliances converting other fuel users to enthusiastic gas consumers. Capable directing, supervising, sales organization. 14 years' experience gas merchandising, customer contact, settling complaints, claims; displays, exhibitions, home beautiful shows and general advertising. Employed, available 30 days, have car. 1028.

Well known engineer experienced in construction, design, engineering, operation, and management, now available on daily, weekly, monthly or yearly basis for advice, studies and reports. Small or large companies. Will collaborate with engineers and managers engaged in making reports thus making steady progress and early completion of such reports possible. 1029.

Sales Supervisor. Fifteen years' experience in appliances familiar with every phase of utility merchandising—particularly strong in gas range, water heaters and refrigeration campaigns. Well versed in househeating and combination property direction. Will take over run down property to demonstrate ability. Married. (35). 1030.

Small Plant Manager—energetic, efficient in small water gas plants. Have made change over coal gas to water gas—water gas to butane; operated butane plant. Understand manufacturing, distribution, high—low pressure; know what it means to maintain friendly public relations. Interested in showing results in operating and sales. 1031.

Sales Engineer or executive have specialized in the sale and promotion of automatic gas water heaters, gas ranges and other gas appliances for over a period of twenty years. Planned and managed many sales campaigns; extensive acquaintance with utility merchandising managers and plumbing supply jobbers. Willing to travel. 1032.

Industrial Gas Representative, (38), Married, ten years' experience in industrial, house-heating, waterheating, hotel and restaurant and promotional work, with special training as cadet engineer in gas industry, special course in metallurgy, special training in electrical equipment and B.S. and M.S. degrees, desires position in sales end. 1033.

Sales. Seasoned and competent; gas industry eleven years manufacturers man (ranges) selling utilities acquiring distributors, etc., traveled Eastern states. Has trained and handled salesmen. Promotional meetings. Experienced marketing. Good contacts and record. Desires manufacturer or utility connection. American (37) Single—Well educated. 1034.

Mechanical Engineer, University graduate (36). 12 years' experience in the oil burning industry as service manager, field engineer and installation foreman on domestic and commercial oil burning systems including boilers, radiators and hot water supply systems. Also power plant testing. 1035.

Junior Statistician: 10 years' experience public utilities. Versed in statistical routine, special reports, unit costs, special studies, preparation of forms in reporting or summarizing balance sheet, operating revenue and operating expense items, graphical presentation of results, reports for trade associations, preparation of data, etc. 1036.

Man with 11 years' intensive utility company experience familiar with all branches of gas company operation. Specializing in industrial and house heating sales, able to direct sales organization. Employed; married. 1037.

SERVICES OFFERED

Accountant. Ten years' general experience; plant and distribution system records maintained and analyzed in accordance with utility and commission requirements. 1038.

Sales Supervising Engineer or Manager. Manufactured and natural gas; college degree, industrial, commercial and domestic; commercial research, advertising, sales promotion, experienced in those quantitative measurements of gas engineering and handling sales people; married. (38). 1039.

General Superintendent or Local Manager. Fifteen years' experience in the production of water gas, coal gas, and Pacific Coast oil gas, high and low pressure distribution and transmission, domestic and industrial installation and utilization. Mechanical engineering education; speaks English and Spanish, employed at present. (37). 1040.

Service Manager, 13 years' natural gas experience, transmission, distribution as construction and maintenance foreman. Domestic, commercial and industrial selling, aiding salesmen to close, advising in heating problems, laying out new systems, renovating and modernizing old systems; specialist in heating, employed. (31). 1041.

Something available in service. Executive with trained ability in engineering, accounting, commercial and legal managership; a background of years of experience in corporation field. Connection with holding company preferred. 1042.

Meter Shop Superintendent, 9 years' experience in gas meter repairs in charge of meter shops repairing 60,000 meters per year. Thoroughly familiar with modern meter work and manufacture of meter diaphragms. University graduate. Good personality; can effect economies. 1043.

As Manager or Works Superintendent. Possess sound knowledge of gas manufacture, purification, and distribution; also the manufacture of Sulphate of Ammonia and the extraction of Benzol, together with general routine of a gas office. 1044.

Manager 24 years' experience in all branches of manufactured coal and water gas. Built and operated plants for sixteen years; with last organization seventeen years every capacity, last eight years as manager property 5,800 meters, showing exceptional results. Have endorsement of city officials and leading business men with fine public relations; married. (44). 1045.

Writer with practical knowledge of selling a fine organization to its employees and the public. Experience in employee publications, research, surveys and employee relations with large western gas and electric company and two outstanding railroads. Thorough knowledge also of preparing utility advertising and publicity. Exceptional references from executives. 1046.

Sales engineer, capable of managing house heating department in all its branches, covering surveys, installation, estimates, sales promotion, service, repairs and maintenance. Experience also covers industrial field with regard to high and low pressure boilers and large volume water heating. Broad general and technical experience; married. 1047.

Public utility auditor and accountant desires to make change. Ten years' experience gas and electric operating and holding companies; good references, familiar with eastern and southern territories. (42). 1048.

POSITIONS OPEN

Midwest appliance manufacturer wants man experienced in design and manufacture of Domestic Hot Water Heaters. Engineering graduate preferred. Application must state experience and salary expected. 0308.

Opening for young man who has had some experience in gas distribution and water gas plant operation. Work would be supervisory as well as some actual work in these departments. 0309.

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